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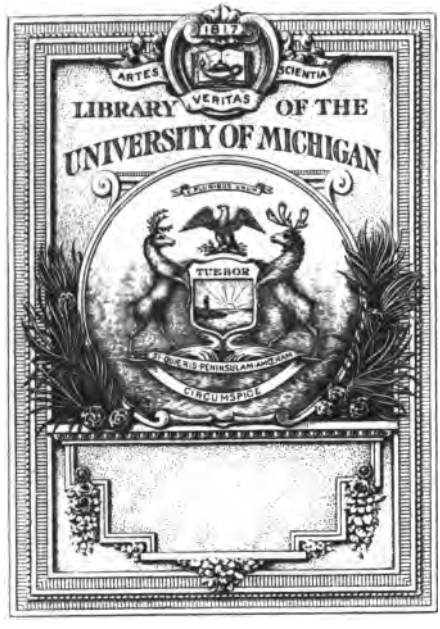
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TRANSACTIONS

OF THE

American Horticutural Society,

FOR THE YEAR 1888.

BEING A REPORT OF THE EIGHTH ANNUAL MEETING, HELD AT SAN JOSÉ,

Compliments of

W. H. RAGAN,

Please acknowledge.

Sec'y American Hort. Society,

GREENCASTLE, IND.

ALSO, A SKETCH
ENTER-

By W. H. RAGAN, Secretary,
Greencastle, Indiana.

INDIANAPOLIS:
CARLON & HOLLENBECK, PRINTERS AND BINDERS.
1888.

TRANSACTIONS

OF THE

American Horticutural Society,

FOR THE YEAR 1888.

BEING A REPORT OF THE EIGHTH ANNUAL MEETING, HELD AT SAN JOSÉ, CAL., JANUARY 24, 25 AND 26, AND RIVERSIDE, CAL., FEBRUARY 7, 8 AND 9, 1888,

TOGETHER WITH

A FULL LIST OF PAPERS READ, WITH ACCOMPANYING DISCUSSIONS. ALSO, A SKETCH OF THE OVERLAND TRIP, WITH LOCAL EXCURSIONS AND ENTERTAINMENTS WHILE IN CALIFORNIA, BY JOHN CLARK RIDPATH, LL. D.

VOL. V.

BY W. H. RAGAN, SECRETARY,
Greencastle, Indiana.

INDIANAPOLIS:
CARLON & HOLLENBECK, PRINTERS AND BINDERS.
1888.

Compl. set to
Terry
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CONSTITUTION

OF THE

AMERICAN HORTICULTURAL SOCIETY.

ARTICLE I. This organization shall be known as the American Horticultural Society. Its object shall be the promotion of horticulture.

ARTICLE II. Any person may become a member upon the payment of two dollars, and membership shall continue upon the payment of two dollars annually.

ARTICLE III. Its officers shall consist of a President, First Vice-President, Secretary and Treasurer, and one Vice-President from each State, who shall be elected by ballot at each annual meeting. The term of office of the President, Vice-President, Secretary and Treasurer shall begin on the first day of July following their election. No person can act as an officer of this Society who does not maintain his membership by the payment of the annual membership fee.

ARTICLE IV. The regular meetings of this Society shall be held annually on the first Tuesday of September, except when otherwise ordered by the Executive Committee, and continue for such time as the committee shall determine.

ARTICLE V. The officers of the Society shall constitute an Executive Committee, at any meeting of which a majority of the members present shall have power to transact business.

ARTICLE VI. Special meetings of the Society may be called by the Executive Committee, and meetings of the committee may be called by the President and Secretary.

ARTICLE VII. This Constitution may be amended by a two-thirds vote of the members present at any regular meeting.

OFFICERS

OF THE

AMERICAN HORTICULTURAL SOCIETY

FOR 1888–89.

PARKER EARLE, PRESIDENT ..... Cobden, Illinois.
T. V. MUNSON, FIRST VICE-PRESIDENT ..... Denison, Texas.
W. H. RAGAN, SECRETARY ..... Greencastle, Indiana.
J. C. EVANS, TREASURER ..... Harlem, Missouri.

STATE VICE-PRESIDENTS.

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Dakota	GEO. H. WHITING	Esmond.
Delaware	DR. J. J. BLACK	Newcastle.
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Florida	EDMUND H. HART	Federal Point.
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Illinois	PROF. T. J. BURRILL	Champaign.
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Manitoba		
Maryland	FRANKLIN DAVIS	Baltimore.

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Michigan	T. T. Lyon	South Haven.
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Mississippi	W. H. Cassell	Canton.
Missouri	L. A. Goodman	Westport.
Montana		
Nebraska	S. Barnard	Table Rock.
Nevada	Ross Lewers	Franktown.
New Brunswick		
New Hampshire	Chas. H. Payson, Jr.	Belmont.
New Jersey	H. I. Budd	Mount Holly.
New Mexico		
New York	T. S. Hubbard	Fredonia.
North Carolina	J. Van. Lindley	Pomona.
Nova Scotia	Geo. D. Hewson	Oxford.
Ohio	N. Ohmer	Dayton.
Ontario	Prof. Wm. Saunders	Ottawa.
Oregon	Dr. J. R. Cardwell	Portland.
Pennsylvania	A. Murdock	Pittsburgh.
Quebec	Hon. Chas. Gibb	Abbottsford.
Rhode Island	Amos M. Eaton	Providence.
South Carolina	S. C. Satterthwait	Aiken.
Tennessee	C. M. Merwin	Medina.
Texas	J. M. Howell	Dallas.
Utah	Rev. David Peebles	Sandy.
Vermont	Dr. T. H. Hoskins	Newport.
Virginia	G. F. B. Leighton	Norfolk.
Washington	Thos. Smith	Colfax.
West Virginia	Geo. Ort	Charleston.
Wisconsin	J. M. Smith	Green Bay
Wyoming	Geo. East	Cheyenne.

STANDING COMMITTEES.

On Experiment Stations.—Prof. E. W. Hilgard of Berkeley, Cal., Prof. W. J. Green of Ohio, Prof. S M. Tracy of Mississippi, Prof. Jas. Troop of Indiana, Hon. R. W. Furnas, of Nebraska.

On Schools of Horticulture.—Prof. J. L. Budd, Ames, Iowa, Dr. A. F. White of California, Dr. E. Kimball of California, N. Ohmer of Ohio, Prof. T. L. Brunk of Texas.

On Societies and Organizations.—T. V. Munson of Denison, Texas, J. M. Smith of Wisconsin, W. C. Strong of Massachusetts, T. S. Hubbard of New York, and W. H. Ragan of Indiana.

On the Rural Press.—E. J. Wickson, San Francisco, Cal., L. M. Holt of California, Jas. G. Kingsbury of Indiana, Frank H. Leavenworth of Michigan, and Dr. T. H. Hoskins of Vermont.

On Botany.—Prof. T. J. Burrill, Champaign, Ill., Gen. John Bidwell of California, Prof. J. G. Lemmon of California, Dr. Joseph Albrecht of Louisiana, C. L. Allen of New York.

On Ornithology.—Rev. G. W. Minier, Minier, Ill., Hon. M. M. Estes of California, Dr. O. P. S. Plummer of Oregon, David Baid of New Jersey, C. M. Hobbs of Indiana.

On Entomology.—Prof. W G. Klee, San Francisco, Cal., Dr. J. R. Cardwell of Oregon, Jacob W. Manning of Massachusetts, Dr. C. C. Cornett of Indiana, and D. B. Wier of Illinois.

On Fungoid Diseases.—C. L. Hopkins, Washington, D. C., Frank S Earle of Illinois, D. S. Marvin of New York, E. H. Cushman of Ohio, and Frank Holsinger of Kansas.

On Irrigation.—A. T. Hatch, Suisun, Cal., J. M. Smith of Wisconsin, R. B. Blowers of California, W. J. Maltby of Texas, and J. E. Cutter of California.

On Landscape Gardening.—L. A. Goodman, Westport, Mo., Amos M. Eaton of Rhode Island, Frank Ford of Ohio, Prof. W. C. Latta of Indiana, and D. S. Hillman of Minnesota.

On Floriculture.—Frank Pentland, Lockland, Ohio, R. Maitre of Louisiana, E. Y. Teas of Indiana, C. Sanders of Missouri, and E. Bourgnignon of California.

On The Nursery.—Hon. C. L. Watrous, Des Moines, Iowa, John S. Collins of New Jersey, H. S. Hurd of Ontario, R. G. Chase of New York, and L. Coates of California.

On Forestry.—Prof. Abbott Kinney, Lamanda Park, Cal., Robt. Douglas of Illinois, Dr. J. C. Ridpath of Indiana, J. S. Hicks of New York, and A. H. Griesa of Kansas.

On Vegetable Gardening.—Hon. J. M. Smith, Green Bay, Wis., J. H. Masters of Nebraska, J. A. Foote of Indiana, Sylvester Johnson of Indiana, and G. W. Endicott of Illinois.

On Pomaceous Fruits.—Hon. P. Barry, Rochester, N. Y., W. C. Strong of Massachusetts, Wyman Elliott of Minnesota, S. Barnard of Nebraska, and Chas. Patterson of Missouri.

On Stone Fruits.—J. S. Harris, La Crescent, Minn., J. Van. Lindley of North Carolina, Hon. Ellwood Cooper of California, D. Ilganfritz of Michigan, and Dr. John J. Black of Delaware.

On Small Fruits.—J. H. Hale, South Glastonbury, Conn., Matthew Crawford of Ohio, F. W. Loudon of Wisconsin, James Edgerton of Ohio, and J. H. Priest of Indiana.

On Viticulture.—Prof. Geo. Husmann, Napa City, Cal., Geo. W. Campbell of Ohio, T. S. Hubbard of New York, J. H. Wheeler of California, and E. Williams of New Jersey.

On Semi-tropic Fruits.—H. J. Rudisill, Riverside, Cal., Edmund H. Hart of Florida, H. K. Bradbury of California, John T. Hardie of Louisiana, and W. H. Cassell of Mississippi.

On Russian Fruits.—Hon. Chas. Gibb, Abbottsford, Quebec, Geo. P. Peffer of Wisconsin, S. D. Hillman of Minnesota, Wm. Roy of Ontario, and Thomas Smith of Washington Territory.

On Nomenclature.—Hon. T. T. Lyon, South Haven, Mich., Hon. H. E. Van Deman of District of Columbia, Dr. A. Furnas of Indiana, Hon. Chas. Gibb of Quebec, and J. H. Masters of Nebraska.

On Fruit and Vegetable Packages.—E. T. Hollister, St. Louis, Mo., T. D. Randall of Illinois, I. A. Wilcox of California, Fred Wellhouse of Kansas, and Chas. F. Pierce of Illinois.

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FOR 1888-9.

Abbott, A. F., San Francisco.....California.
Abbott, Mrs. A. F., San Francisco.....California.
Adams, John, Santa Rosa.....California.
Adams, E. C., Fillmore.....Indiana.
Agnew, A., Agnew.....California.
Albaugh, N. H., Tadmor.....Ohio.
Albee, O. J., Lawrence.....California.
Albertson & Hobbs, Bridgeport.....Indiana.
Albrecht, Dr. Joseph, U. S. Mint, New Orleans.....Louisiana.
Allegretti, J., West Berkeley.....California.
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Allen, Prof. C. H., San José.....California.
Allen, T. C., Riverside.....California.
Allen, D. C., Greencastle.....Indiana.
Allen, C. L., Garden City.....New York.
Allen, E. W., 171 Second street, Portland.....Oregon.
Alley, O. F., San José.....California.
Alsip, E. K., Sacramento.....California.
Amoore, H. E., 120 Sutter street, San Francisco.....California.
Anderson, Mrs. E. E., Colbrook.....Ohio.
Anderson, Frank A., Kansas City.....Missouri.
Anderson, J. Z., San José.....California.
Andrews, Dr. G. P., 83 Lafayette avenue, Detroit.....Michigan.
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Barth, Miss Katie, Mascoutah.....Illinois.
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Bayles, James A., Lee's Summit.....Missouri.
Bean, James, Box 392, San José.....California.
Beard, J. L., Warm Springs.....California.
*Bebee, H. Y., Ravenna.....Ohio.
Beebe, W. H., Ravenna.....Ohio.
Beck, Adolph, 435 California street, San Francisco.....California.

* Deceased.

Been, Charles, San José ..... California.
Bell, C. S., Jr., Lexington ..... Kentucky.
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Blanchard, Nathan W., Santa Paula ..... California.
Block, A., Santa Clara ..... California.
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Earle, Frank S., Cobden.....Illinois.

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Grimes, Miss Emma E., Minneapolis.....Minnesota.
Grimes, Miss Mary A., Minneapolis.....Minnesota.
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Hall, Bennett, Carthage.....Missouri.
Hall, Priestley, Riverside.....California.
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Hammond, Mrs. T. C., Greencastle.....Indiana.
Handy, J. A., Wichita.....Kansas.
Hardie, John T., New Orleans.....Louisiana.
Harms, L., Euclid.....Ohio.
Harring, S. H., Los Gatos.....California.
Harrington, C., Painesville.....Ohio.
Harrington, Mrs. C., Painesville.....Ohio.
Harrington, W. T., Rock Creek.....Ohio.
Harris, J. S., La Crescent.....Minnesota.
Harrison, J. J., Painesville.....Ohio.
Hart, E. H., Federal Point.....Florida.
Harvey, O., Galt.....California.
Hatch, A. T., Pres. State Fruit Union, Suisun.....California.
Hauss, T., Yuba City.....California.
Hazelett, Samuel A., Greencastle.....Indiana.
Heikes, W. F., Huntsville.....Alabama.
Henderson, Peter, 35 Courtlandt street, New York.....New York.
Hendry, F. T., Indianapolis.....Indiana.
Henry, Allen, Chico.....California.
Henry, D. H., Geneva.....New York.
Herrick, S. H., Riverside.....California.
Hewson, George D., Oxford.....Nova Scotia.
Hewson, Mrs. George D., Oxford.....Nova Scotia.
Hibbard, A. A., Chico.....California.

Hicks, J. S., Roslyn.....New York.
Hiestand, Amos, Hitner.....Pennsylvania.
Hilgard, Prof. E. W., Pres. State Hort. Society, Berkeley.....California.
Hill, W. E., Nebraska City..... Nebraska.
Hillis, W. D., Odin ..... Illinois.
Hillman, S. D , Sec'y State Hort. Society, Minneapolis ..... Minnesota.
Hines, J. W., San José.....California.
Hoag, I. N., Lugonia..... California.
Hollister, E. T. 811 N. Third street, St. Louis.....Missouri.
Holman, Frank, Aurora..... Indiana.
Holman, D. S., Treas. State Hort. Society, Springfield..... Missouri.
Holmgren, Dr. C. J., 33 Waller street, San Francisco.....California.
Holsinger, Frank, Sec'y Mo. Valley Hort. Society, Rosedale..Kansas.
Holt, L. M., Riverside..... California.
Holt, A. K., Riverside .....California.
Honn, D. N., Redding.....California.
Hopkins, C. L., Assistant Pomologist, Washington..... D. C.
Hoskins, Dr. T. H., Newport.....Vermont.
Hovey, F. A., Lincoln .....Nebraska.
Howard, R. H., 792 Lafayette avenue, Brooklyn.....New York.
Howell, T. J., Redding..... California.
Howell, A. B., Chattanooga.....Tennessee.
Howell, J. M., Dallas.....Texas.
Howell, Earle Ragan, Dallas .....Texas.
Hubbard, T. S., Fredonia .....New York.
Hubbard, William S., Indianapolis .....Indiana.
Huber, Theophile, Illinois City.....Illinois.
Hughes, Dr. R., Okawville..... Illinois.
Hughes, Mrs. Dr. R., Okawville.....Illinois
Hull, Ransom, Burgh Hill .....Ohio.
Hull, T. B., Yuba City.....California.
Hunting, H. H., Los Gatos.....California.
Hurd, H. H. & Son, Burlington.....Ontario.
Husmann, Prof. George, Napa City.....California.
Ilgenfritz, D., Monroe.....Michigan.
Jaeger, Hermann, Neosho.....Missouri.
Jandon, B. A., Palmyra.....Missouri.
Jandon, Mrs. E. A., Palmyra ..... Missouri.
Jarvis, George M., San José.....California.
Jarvis, Dr. Joseph, Riverside.....California.
Johnson, Sy vester, Irvington.....Indiana.
Johnson, E. M., Indianapolis..... Indiana.
Johnson, F. C., Kishwaukee.....Illinois.
Johnson, James T., Warsaw.....Illinois.
Joly, Charles, 11 Rue Boissy d'Anglais, Paris ..... .France.
Jones, A. F., Oroville .....California.
Jones, G. N., San José.....California.
Kanatzar, A., Centralia ..... Missouri.
Kattler, John A., Aurora.....Illinois.
Keefe, T. P., 179 La Salle street, Chicago .....Illinois.
Keith, P. G., Campbell .....California.
Keith, Mrs. Lucy M., Bakersfield.....California.
Kellogg, George J., Janesville.....Wisconsin.
Kellogg, H. D., San José .....California.
Kells, R. C., Yuba City.....California.
Kellum, Parker, Waco.....Texas.

*Kendel, A. C., Cleveland.....Ohio.
Kendel, Mrs. A. C., Cleveland.....Ohio.
Kennedy, J. F., Los Gatos.....California.
Kerr, A. W. & J. S., Sherman.....Texas.
Kimball, Dr. E., Haywards.....California.
Kimball, E. E., Nevada.....Missouri.
Kimball, Frank A., National City.....California.
Kimball, Warren C., National City.....California.
King, C. S., San Lorenzo.....California.
King, Joseph D., Ravenna.....Ohio.
Kingsbury, J. G., Indianapolis.....Indiana.
Kinney, Prof. Abbott, Lamanda Park.....California.
Kipp, Charles, San José.....California.
Kirkpatrick, E. W., McKinney.....Texas.
Kizer, T. W., Winchester.....Indiana.
Kizer, Mrs. C. S., Winchester.....Indiana.
Klee, W. G., 220 Sutter street, San Francisco.....California.
Klinefelter, P. K., Riverside.....California.
Knowlton, C., Joliet.....Illinois.
Kyle, J. G., Riverside.....California.
Lake, D. S., Shenandoah.....Iowa.
Lane, J. A., Greencastle.....Indiana.
Latta, Prof. W. C. (Purdue University), Lafayette.....Indiana.
Lauck, Joseph B., 314 Ninth street, Oakland.....California.
Lawrence, G. W., North Manchester.....Indiana.
Lawrence, Mrs. Jennie C., North Manchester.....Indiana.
Lawson, Robert P., Riverside.....California.
Layne, Theo. M., Cloverdale.....Indiana.
Leavenworth, Frank H., Detroit.....Michigan.
Leete, B. F., Reno.....Nevada.
Leighton, G. F. B., Norfolk.....Virginia.
Lemmon, Prof. J. G., Oakland.....California.
Lemmon, Mrs. Prof. J. G., Oakland.....California.
Leonard, M. A., Bangor.....New York.
Lesley, J. P., Santa Ana.....California.
Lester, T. C., Alpena.....Michigan.
Lewers, Ross, Franktown.....Nevada.
Lewis, D. C., Portland.....Oregon.
Lewis, William, Kansas City.....Missouri.
Library Columbus Hort. Society, Columbus.....Ohio.
Library Experiment Station, Athens.....Georgia.
Library Ohio Experiment Station, Columbus.....Ohio.
Library Indiana Hort. Society, Indianapolis.....Indiana.
Library Purdue Experiment Station, Lafayette.....Indiana.
Library Mass. Agri. College, Amherst.....Massachusetts.
Library Jasper County Hort. Society, Carthage.....Missouri.
Library Experiment Station, Agricultural College.....Mississippi.
Library State Hort. Society, Minneapolis.....Minnesota.
Library Northern Club, Norfolk.....Virginia.
Library County Hort. Society, Winfield.....Kansas.
Library Agricultural Experiment Station, Champaign.....Illinois.
Lindley, J. Van., Pres. State Hort. Society, Pomona.....North Carolina.
Lindley, Milton, Los Angeles.....California.
Little, A. H., Nashville.....Arkansas.
Livermore, Horatio P., Oakland.....California.

* Deceased.

Logan, Miss Minnie, Palmyra.....Missouri.
Lorbeer, C. I., Pomona.....California.
Loudon, F. W., Janesville.....Wisconsin.
Lovett, John T., Little Silver.....New Jersey.
Lowe, W. W., Long Beach.....California.
Lundeen, A., Osage City.....Kansas.
Luther, Mrs. J. S, Lemont.....Illinois.
Lyman, Henry L., Charlottsville.....Virginia.
Lyon, T. T., Pres. State Hort. Society, South Haven.....Michigan.
Lyons, William, Box 685, Minneapolis.....Minnesota.
Maitre, R., 140 Canal street, New Orleans.....Louisiana.
Maltby, W. J., Baird.....Texas.
Mann, Wm. Nelson, Riverside.....California.
Mannering, George W., Pewaukee.....Wisconsin.
Manning, Jacob W., Reading.....Massachusetts.
Markey, John, Geyserville.....California.
Marvin, D. S., Watertown.....New York.
Mason, R. D., Ripon.....Wisconsin.
Masters, J. H., Nebraska City.....Nebraska.
Matlock, Mrs. Alice, San José.....California.
Matthews, A. B., Kansas City.....Missouri.
Matthews, Dr. J. N., Mason.....Illinois.
Maxwell, J. W., Euclid.....Ohio.
Meacham, R. W., Riverside.....California.
Merryfield, J. O., Winnebago.....Illinois.
Merwin, C. M., Medina.....Tennessee.
Mesler, W. P., Cobden.....Illinois.
Miles, B. S., Gray's Summit.....Missouri.
Miller, A. S., Pittsburgh.....Pennsylvania.
Miller, C. C., Riverside.....California.
Miller, C. J., Canal Fulton.....Ohio.
Miller, F. C., New Philadelphia.....Ohio.
Miller, Dr. J. H., Redding.....California.
Miller, N. J., Duluth.....Minnesota.
Miller, Mrs. N. J., Duluth.....Minnesota.
Miller, R. M., Marysville.....California.
Miller, J. C., Rome.....Georgia.
Mills, W. H., Plainfield.....Indiana.
Minier, Rev. G. W., Minier.....Illinois.
Monroe, Hon. C. J., South Haven.....Michigan.
Monsees, J. H., Beaman.....Missouri.
Montgomery, Robert, Oregon.....Missouri.
Montgomery, Mrs. Robert, Oregon.....Missouri.
Moore, Mrs. H. R., Greencastle.....Indiana.
Moore, W. H., Rahway.....New Jersey.
Moore, David M., Ogden.....Utah.
Morey, I. P., Osage Mission.....Kansas.
Morgan, S. D., 95 Clark street, Chicago.....Illinois.
Morrell, H. C., Wright's.....California.
Morrell, J. C., San José.....California.
Morton, James, Tulare.....California.
Morton, J. R., San José.....California.
Moulton, L. F., Colusa.....California.
Mudge, Augustus, Danvers.....Massachusetts.
Mudge, Lucius A., Danvers.....Massachusetts.
Munson, T. V., Pres. State Hort. Society, Denison.....Texas.

Munson, Mrs. Maria, Denison.....Texas
Murdock, John R. & A., 508 Smithfield street, Pittsburgh .....Pennsylvania.
Murry, Dr. R. D., Key West.....Florida.
Myers, George T., Portland.....Oregon.
Myrick, W. H., Santa Clara.....California.
McAfee, L. C., Oroville.....California.
McBr de, Mrs. G., San José.....California.
McCabe, T. J., Cottonwood.....California.
McClelland, T. W., San José.....California.
McIntyre, H. W., Vina.....California.
McKay, Prof. A. B., Agricultural College.....Mississippi.
McKeen, W. R., Terre Haute.....Indiana.
McKeen, Arthur, Terre Haute.....Indiana.
McLaren, Hon. John, Orangeville.....Ontario.
Nash, W. H., San Francisco.....California.
Newberry John C., Pilot Point.....Texas.
Newhall, S., San José.....California.
Newhall, Mrs. S., San José.....California.
Newmyer, J. S., Love Lake.....Missouri.
Niagara White Grape Co., Lockport.....New York.
Nimon, James, Denison.....Texas.
North L., Hudson.....Wisconsin.
Offield, J. W., Santa Clara.....California.
Ogden, M. B., Riverside.....California.
Ohmer, N., Pres. Hort. Society, Dayton.....Ohio.
Ohleyer, George, Yuba City.....California.
Oliver, J. B., Centerville.....Mississippi.
Oliver, W., Santa Clara.....California.
Ort, George, Charleston.....West Virginia.
Osborn, H. S., Quincy.....Illinois.
Ostrom, D. A., Wheatland.....California.
Ousley, C. N., Dallas.....Texas.
Overton, John L., Pomona.....California.
Parkison, W. C., Antioch.....California.
Parmelee, Ed. F., Reading.....Michigan.
Patten, C. G., Pres. State Hort. Society, Charles City.....Iowa.
Patterson, Charles, Kirksville.....Missouri.
Paulsen, Thomas, Portland.....Oregon.
Payson, Charles H., Jr., Belmont.....N. Hampshire.
Peebles, Rev. David, Sandy.....Utah.
Peffer, George P., Pewaukee.....Wisconsin.
Penhallow, Prof. D. P. (McGill College), Montreal.....Quebec.
Pentland, Frank, Lockland.....Ohio.
Perkins, D. K., Oroville.....California.
Pierce, Charles F., 205 La Salle street, Chicago.....Illinois.
Platt, P. E., Sacramento.....California.
Plummer, Dr. O. P. S., Portland.....Oregon.
Plummer, Thomas, San José.....California.
Plummer, Charles G., Davenport.....Iowa.
Polhemus, B. M., Boundbrook.....New Jersey.
Posey, Miss Lizzie, Rushville.....Indiana.
Pratt Bros., Rochester.....New York.
Pratt, J. J., Yuba City.....California.
Preston, J. B., Santa Clara.....California.
Priest, J. H., Greencastle.....Indiana.
Prutzman, Joseph E., Three Rivers.....Michigan.

Pryal, A. D., North Temescal.....California.
Ragan, W. H., Sec'y A. H. S., Greencastle.....Indiana.
Ragan, Miss Belle, Greencastle.....Indiana.
Ragan, R. M., Fillmore.....Indiana.
Ragan, J. W., Fillmore.....Indiana.
Ragan, J. S., Hartland.....Kansas.
Ragan, H. H., Salem.....Oregon.
Ragan, Miss Nannie, Santa Ana.....California.
Ragan, W. H., High Point.....North Carolina.
Rainey, Horace, Columbia.....Tennessee.
Randall, T. D., 219 South Water street, Chicago.....Illinois.
Randall, Mrs. T. D., Chicago.....Illinois.
Randall, Miss Ida C., Chicago.....Illinois.
Rea, Robert M., Sioux City.....Iowa.
Rider, Preston, Crothersville.....Indiana.
Ridpath, Dr. J. C., Greencastle.....Indiana.
Roberts, B. F., Santa Rosa.....California.
Robinson, G. C., Marine City.....Michigan.
Robinson, Mrs. Josephine, Marine City.....Michigan.
Roesch, Lewis, Fredonia.....New York.
Rommel & Sobbe, Morrison.....Missouri.
Rose, Lucius, Akron.....Ohio.
Rosebro, W. E., Crawfordsville.....Indiana.
Ross, W. W., Pilot Point.....Texas.
Roy, William (Royston Park), Owen Sound.....Ontario.
Royston, C. H., Aurora.....Illinois.
Rudisill, H. J., Riverside.....California.
Rudisill, M. B., Greencastle.....Indiana.
Rudisill, Miss S. E., 337 Park avenue, Indianapolis.....Indiana.
Runyon, Sol., Courtland.....California.
Ruoff, E. A., 335 Gratiot avenue, Detroit.....Michigan.
Russell, J., Hayward's.....California.
Ryckman, G. E., Brockton.....New York.
Salfisburg, A. C., Aurora.....Illinois.
Samuels, J. M., Clinton.....Kentucky.
Sanders, James, Westfield.....Indiana.
Sanders, C., 2625 Pine street, St. Louis.....Missouri.
Sanders, L. T., Collingsburg.....Louisiana.
Sanderson, L. F., San José.....California.
Sauffrignon, F. J., San José.....California.
Saunders, Prof. Wm., Ottawa.....Ontario.
Saunders, S. P., San José.....California.
Schaible, John G., Elyria.....Ohio.
Schrock, C. B., Riverside.....California.
Schultz, A. C., Woonsocket.....Dakota.
Schwartzkopp, Frank, Columbus.....Indiana.
Schwitzer, O. W., Cottonwood.....California.
Scofield, L. K., Fort Scott.....Kansas.
Scott, D. Wilmot, Sec'y Nurserymen's Ass'n, Galena.....Illinois.
Sells, Mrs. Michael, 321 North N. J. street, Indianapolis.....Indiana.
Settle, C. T., San José.....California.
Shaw, O. B., Sonoma.....California.
Shaw, Isaiah, San José.....California.
Shearer, Rev. F. E., Santa Rosa.....California.
Sheffer, C. M., South Haven.....Michigan.
Shepherd, A., M. D., Glendale.....Ohio.

Shinn, Joseph C., Niles.....California.
Shotwell, H. E., Bennett.....Nebraska.
Shoup, George L., Salmon City.....Idaho.
Showerman, D., Detroit.....Michigan.
Simonds, Dr. J. F., Fayetteville.....Arkansas.
Sinclair, H. H., Lugonia.....California.
Skinner, F. R., Eau Claire.....Wisconsin.
Smith, J. M., Pres. State Hort. Society, Green Bay.....Wisconsin.
Smith, Mrs. J. M., Green Bay.....Wisconsin.
Smith, Miss Sarah G., Morristown.....New Jersey.
Smith, Thomas, Colfax.....Washington.
Smith, C. H., Mason City.....Iowa.
Smith, Mrs. C. H., Mason City.....Iowa.
Smith, Miss H., Mason City.....Iowa.
Smith, Prof. J. D., Livermore.....California.
Smith, Mrs. Prof. J. D., Livermore.....California.
Smith, E. O., San José.....California.
Smith, W. W , Vacaville.....California.
Smith, George, San Leandro.....California.
Smith, Rev. Samuel B., Amelia.....Ohio.
Smith, D. Edson, Sec'y Hort. Society, Santa Ana.....California.
Smith, J. Spencer, Carrollton.....Illinois.
Snow, H. K., Tustin City.....California.
Somers, W. H., El Cajon.....California.
Sprague, M. A. Berea.....Ohio.
Stabler, B. G., Yuba City.....California.
Stabler, H. P., Yuba City.....California.
Stark, W. P., Louisiana.....Missouri.
Start, George H., San José.....California.
Stell, Dr. W. W., Paris.....Texas.
Stephens, E. F., Crete.....Nebraska.
Stephenson, Gov. C. C., Carson City.....Nevada.
Sterling, S. T., Camden.....Indiana.
Stevens, J. C., Centreville.....Indiana.
Stevens, Nat., Forney.....Texas.
Steward, Dr. J. A., Santa Cruz.....California.
Stickney, J. S., Wauwatosa.....Wisconsin.
Stone, A., Winchester.....Indiana.
Stone, I. N., Sioux City.....Iowa.
Stone, Mrs. I. N., Sioux City.....Iowa.
Stoner, G. W., Jewella.....Louisiana.
Stowe, George M., Riverside.....California.
Strong, William C., Brighton.....Massachusetts.
Stude, Alphonse, Houston.....Texas.
Swales, Charles E., Detroit.....Michigan.
Swayne, T. J., National City.....California.
Sweet, M. E., Kirtland.....Ohio.
Sweet, Mrs. M. E., Kirtland.....Ohio.
Syer, Robert, San José.....California.
Talcott, John B., Gates' Mills.....Ohio.
Tamari, Prof. Kizo, Imperial College of Agric., Tokio.....Japan.
Tarlton, G. W., San José.....California.
Taylor, Franklin, Indianapolis.....Indiana.
Taylor, H. A., Hudson.....Wisconsin.
Taylor, Mrs. H. A., Hudson.....Wisconsin.
Teas, E. Y., Dunreith.....Indiana.

Tenney, F. M., San José.....California.
Thomas, L. H., 54 Sangamon street, Chicago.....Illinois.
Thomas, Prof. W. S., Little Rock.....Arkansas.
Thomas, Milton, Los Angeles.....California.
Thompson, W. W., Smithville.....Georgia.
Thompson, S. C., Edinburg.....Indiana.
Thompson, J. M., Napa City.....California.
Thompson, M. T., East Rockport.....Ohio.
Thorp, Warren A., Mayfield.....Ohio.
Tibbetts, Luther C., Riverside.....California.
Towle, G. W., Santa Clara.....California.
Townsend, Charles A., West Cleveland.....Ohio.
Townsend, Mrs. Charles A., West Cleveland.....Ohio.
Tracy, Prof. S, M. (Exp. Station), Agricultural College.....Mississippi.
Troop, Prof. James (Experiment Station), Lafayette.....Indiana.
Tuttle, Sidney & Co., Bloomington.....Illinois.
Tryon, George A., Galesburg.....Illinois.
Tryon, H. G., Pres. State Hort. Society, Willoughby.....Ohio.
Van Deman, Prof. H. E., U. S. Pomologist, Washington.....D. C.
Van Deman, Mrs. Prof. H. E., Washington.....D. C.
Van Dusen, C. L., Nursery Co., Geneva.....New York.
Van Zandt, C., 57 Charlotte street, New York.....New York.
Veal, W. G., Fort Worth.....Texas.
Veeder, P. V., Grafton.....California.
Vestal, V. C., San José.....California.
Vrooman, H. M., San José.....California.
Walton, B. F., Yuba City.....California.
Warfield, B. C., Sandoval.....Illinois.
Watkins, Mrs. L. J., San José.....California.
Watrous, C. L., Pres. Nurserymen's Ass'n, Des Moines.....Iowa.
Watson, W. P., Yaquina.....Oregon.
Watton, W., 131 Woodward avenue, Detroit.....Michigan.
Weber, Miss Nettie, Duluth.....Minnesota.
Weinberger, Mrs. H. E., St. Helena.....California.
Weller, J. R., Milpitas.....California.
Wellhouse, Fred., Fairmount.....Kansas.
Westermann, Emile, Malvern.....Arkansas.
Western Tree Planter Publishing Co., Elgin.....Illinois.
Wetmore, Charles H., Jefferson avenue, Detroit.....Michigan.
Wheeler, Gilbert, 81 Clark street, Chicago.....Illinois.
Wheeler, J. H., State Viticultural Officer, San Francisco.....California.
Wheeler, Henry H., Pomona.....California.
White, W. H., Lena.....Indiana.
White, James A., Santa Rosa.....California.
White, Dr. A. F., Santa Rosa.....California.
White, C. F., Lincoln.....Nebraska.
Whiting, George H., Esmond.....Dakota.
Wickson, E. J., Berkeley.....California.
Wier, D. B., Lacon.....Illinois.
Wilbur, D. L., Riverside.....California.
Wilcox, I. A., Santa Clara.....California.
Wilcox, J. W., Pratt.....Kansas.
Willard, S. D., Geneva.....New York.
Williams, E., Sec'y State Hort. Society, Montclair.....New Jersey.
Williams, E. H., 23 South Delaware street, Indianapolis.....Indiana.
Williams, Dr. R. J., Gadsden.....

Williams, L. A., Glenwood.....Iowa.
Williams, C. E., Cottonwood.....California.
Willis, John J., High street, Harpenden.....England.
Wilson, William, Brazil.....Indiana.
Winegar, A. B., Livermore.....California.
Wingate, M., San José.....California.
Winters, Theodore, Washoe.....Nevada.
Witter, William E., Oneida.....New York.
Wood, Edward, Redding.....California.
Woods, Mrs. Nevie, Pecksburg.....Indiana.
Woody, William M., Pomona.....California.
Woolsey, G. S., National City.....California.
Wright, Mrs. R. W., 271 Woodward avenue, Detroit.....Michigan.
Wyman, Gilbert J., Fruitvale.....California.
Zierngibl, Mrs. Minnie, St Helena.....California.
Zook, Levi, Oregon.....Missouri.

PROCEEDINGS

OF THE

EIGHTH REGULAR MEETING

OF THE

AMERICAN HORTICULTURAL SOCIETY.

(Formerly the Mississippi Valley Horticultural Society.)

At the seventh meeting of this Society, held in the city of Cleveland, O., September, 1886, it was resolved to hold the next meeting in California, with certain provisos, viz.: That the horticulturists of California should desire the Society to meet in their state, and that acceptable railroad rates could be secured. To this end, the Secretary immediately entered into correspondence with the transcontinental railway authorities, with the purpose of first securing the important object of an early settlement of the question of rates. Meantime, California horticulturists were not slow to act their part in evincing their great desire to bid us welcome to their homes and to their hospitalities. On March 9, 1887, the Secretary received from Riverside a lengthy telegram, cordially inviting the Society to hold its meeting in that place, and pledging themselves, in the event that the Society met there, to get up "the largest and finest citrus fair in connection therewith ever held on the continent." Almost simultaneously with the receipt of this telegram came a lengthy communication from San José, from the mayor of the city and committees representing the Grange, the Viticultural and the

Horticultural Societies, urgently inviting the meeting of the Society to that city. From time to time these invitations were renewed and strengthened by letters, telegrams and press notices emanating from various sections of the state, and almost invariably uniting upon one or the other of the places named. Under such favorable influences as were here presented, and in view of the widely different horticultural interests represented in the vicinity of the two places, the officers of the Society decided to hold the meetings in two sections, the first at San José and the second at Riverside.

In obedience to this arrangement the American Horticultural Society convened in the Baptist Tabernacle in the city of San José, Cal., on Tuesday, January 24, 1888, at 10 o'clock A. M., Hon. Parker Earle, President, in the chair. A creditable delegation of leading horticulturists, representing many of the eastern states, with a large number from California, Oregon and other Pacific coast states and territories, were present at the opening session. Representatives of the press, especially of the California press, were numerous, and, as their reports fully verify, were not only intelligent, but also deeply interested in the subsequent proceedings of the Society. The Secretary will here take occasion to say that never in the history of this Society have the services of the press been so cordially given, and of such inestimable value, as in the case of the California meetings. For these valuable services his individual thanks, and through him the thanks of the Society, are hereby extended to all press representatives, without distinction, from those first met at Denison, Texas, to the close at Santa Barbara, Cal., who have, by their labors and attentions, added so much of interest to the Society while in session and during its numerous excursions, general and local.

President Earle, of Illinois—Ladies and Gentlemen: Our meeting this forenoon will be informal. Our first regular papers and discussions will be reserved for the afternoon session. Among the numerous special attractions prepared by the good people of San José for our entertainment, while sojourning in their beautiful city, that of a citrus fair and horticultural exhibition, now in progress in their elegant pavilion, is not the least attractive. To this you are all invited, and in due time will be presented with complimentary tickets by President Cyrus Jones, who now occupies a place by my

side. This courtesy will be extended only to those who are members of the Society. I hope this hint will be sufficient to greatly increase the membership in the Society, which is always easily accomplished, and consists in paying $2 to our Secretary. There are various other, and even greater, advantages to be gained by joining our Society, which will be made apparent hereafter.

J. B. Lauck, of California, Traveling Passenger Agent of the Southern Pacific Railway—Mr. President, if you will allow me, I should like to request all members from outside the state of California to meet me during the noon recess, as our company has instructed me to tender all such members of your Society (whom I wish now to enroll) a free excursion through the Napa and Sacramento valleys, after the close of these meetings.

President Earle—This is a very generous offer, and I trust that our people will not be slow to accept it. In behalf of the Society, I thank you, Major Lauck, and your liberal-spirited railway company, for your magnanimous proposition to show us through these fine valleys.

On motion of Mr. T. S. Hubbard, of New York, a Committee on Order of Business was appointed by the President, consisting of Mr. Hubbard of New York, Mr. Wilcox of California, Mr. Smith of Wisconsin, Mr. Avery of Iowa, Major Evans of Missouri, and Secretary Ragan of Indiana.

The President—While the Committee on Order of Business is out for consultation, I wish to present a few of the many

LETTERS RECEIVED FROM OUR ABSENT FRIENDS.

I will not attempt to read all these letters, but leave the greater number of them for our Secretary to publish without reading. The first, and, perhaps, the most important, letter which I shall read you—important especially because of the eminent position in horticultural affairs held by its author, and because of its far distant origin—is that from the hand of the editor of the London (Eng.) *Horticultural Times and Covent Garden Gazette,* in which he expresses his regret (which we feel even more keenly than he possibly can) and his great disappointment at not being permitted to attend these meetings. This, it would seem, is due—as I suspect it may be

in case of others who had expected to be with us—to the unfortunate change of time in the holding of our meetings, made necessary in order to secure favorable railroad rates:

LONDON, December 31, 1887.

W. H. Ragan, Secretary A. H. S.:

DEAR SIR: I am extremely sorry that the date of the annual meeting has been changed, as your letter notifying the change only arrived yesterday, and, of course, it would be impossible to get to New York by January 8. This change will, I am sorry to say, prevent the English delegates from being present, though I am afraid that one or two of our readers who had intended going in a private capacity will make the journey too late. But, of course, we could not expect for one moment to inconvenience your Society. Personally I should have much enjoyed being present, and I hope you will convey to the meeting the hearty expressions of good will both by the English gardening press and the English gardening public. I hope the meeting will be, as it deserves, a great success.

Yours, sincerely, EDITOR H. T.

Next I have a letter from that most eminent and exceedingly worthy fungologist whom American horticulturists all delight to honor, Prof. T. J. Burrill, of Illinois:

Parker Earle: CHAMPAIGN, ILL., December 19, 1887.

MY DEAR SIR—Nothing would please me better than to obey your mandate and go across the continent. Two of the trustees urged upon me the importance of going, but they did not find it possible to do more than possibly grant leave of absence. I am now buried with work, and could hardly hope for resurrection if I let a month's time pass. Altogether, the rich treat can not be accepted. But I will do my best in the way of a paper or papers, and will hurrah for the meeting everywhere. T. J. BURRILL.

Here is a letter from a man who, perhaps, has spent more time and money in his efforts to introduce varieties of hardy fruits from abroad into the more northern sections of our country than any American citizen, living or dead, and to whom we of the east should feel most thankful. We all regret his absence. He is now fruiting, on trial, of his own importations, hundreds of varieties of apples and other hardy fruits from Russia and North Germany, at his home in Quebec:

Hon. Parker Earle: ABBOTTSFORD, PROV. QUE., January 11, 1888.

DEAR SIR—I have been again absent some days, and my reply may be too late. I spent two months in California last summer, or would have made every effort to have been with you on this excursion. You ask me for a paper on Russian fruits, but really I have nothing new. I have, however, on trial in my orchard

seventy-five varieties of Russian and German apples and many other things, and it will not be long before I shall be able to give you some facts. I am really sorry I can not be with you. Yours, truly, CHAS. GIBB.

No more valuable scientific papers have ever been presented to this Society than those published in volumes I and II of its transactions on "Insects Affecting the Strawberry," from the pen of that greatest of American entomolgists, Prof. Forbes. His well recognized ability has won for him such numerous and pressing engagements that it seems he can only find time nowadays to briefly express his regrets for enforced absence:

CHAMPAIGN, ILL., December 19, 1887.

Mr. Parker Earle, President American Horticultural Society:

DEAR SIR—Your programme of travel and your subject for an address are both particularly inviting, and I wish that it were in any way possible for me to accept your very cordial invitation. While I suppose I could take the bit in my teeth and run away, yet if I pay any attention whatever to my duties and engagements it is absolutely impossible for me to leave. I am down for farmers' institutes enough to keep me almost continuously busy during the period of the proposed trip, to say nothing of the university work and the necessary entomological and zoölogical writing on the reports of the office. I have also agreed to give some outside lectures, which will further prevent my absenting myself at that time. The thing I most regret is my inability to meet *your wishes* in the matter, and if it were anything less than absolute inability, I would do what you wish without question. Very truly yours, S. A. FORBES.

Here is a short letter from one of our greatest lights. No person who reads that best of all rural papers, the *Rural New Yorker*, will lightly value even a "short" letter from its able editor. E. S. Carman embodies the very essence of sincerity in his letter of regrets:

DEAR PARKER EARLE: Thank you very much for your kind letter. I wish you knew how much I would like to go with you, and how entirely impossible it is for me to do it. Best wishes. E. S. CARMAN.

Rev. E. P. Roe, widely known to fame as an author, is none the less an horticulturist. Some of his most charming productions have been in the line of horticultural literature. Nor is this all. There is in this line of work something more than the mere embellishments acquired in the field of horticultural literature. Brother Roe is, withal, a practical horticulturist:

CORNWALL-ON-THE-HUDSON, N. Y., December 19, 1887.

Mr. Parker Earle, President American Horticultural Society:

MY DEAR SIR—I wish you were going to California in '89, for then I would gladly join you. I am now anchored on the Hudson for a year, and am loaded down to the water's edge with literary work, which must be completed by certain dates. If my time were my own I would gladly write you a paper. You will be charmed with Southern California. I hope you will go to Santa Barbara, the loveliest city on the coast. Yours, sincerely, E. P. ROE.

Here is a letter from one of our number who, although generally prevented from attending our meetings, "never forgets us;" and while his letters embody the social features, well expressed, they invariably present food for thought. Here is one of W. H. Cassell's characteristic letters:

CANTON, MISS., January 10, 1888.

W. H. Ragan, Secretary, Greencastle, Ind.:

DEAR SIR—After my regrets, heartfelt, at being compelled by circumstances to forego the pleasure and profit of this grand "Occidental" excursion, permit me to ask for a discussion at this meeting of the best methods of propagating nut-bearing trees, and especially the pecan. At the last meeting of the Society, in Cleveland, a paper on nut culture was read by Mr. J. T. Lovett, of New Jersey, but he mentioned no other mode of propagating the trees except from seeds. Pecan culture is receiving considerable attention in this state, particularly by those who have bottom lands subject to overflows which prevent them from being profitably cultivated in the ordinary crops, and yet which do not hurt the pecan trees. There are from one hundred to one thousand trees being planted by some parties, but altogether seedlings. There is a great difference in the fruit of different trees as to quality, size, thickness of shell, etc. Some of the nuts are oval, some are long and pointed. Now, if these promiscuous seedlings can be readily grafted or budded with the more desirable kinds a great advantage will be gained, especially as the trees live and bear "forever." English walnuts are also being planted to some extent—more, however, for family use than market; also, a limited number of Spanish chestnuts, black walnuts, etc. The interest in nut culture is increasing greatly, and I feel confident that a discussion eliciting the best methods of propagation will be of great and general benefit to the country at large.

Wishing the meeting great success, very respectfully, W. H. CASSELL.

Through B. M. Lelong, Secretary of this State Board of Horticulture, we have the following from its able President. We truly hope to see Mr. Cooper at our Riverside meeting:

ELLWOOD, CAL., January 21, 1888.

To B. M. Lelong, Sec'y State Board of Horticulture, 220 Sutter street, San Francisco:

DEAR SIR—Please present to the American Horticultural Society my regrets at not being able to attend the meeting at San José. I am now in the midst of

olive-oil making, and can not be absent from home. I fear, also, that the heavy rains will prevent my attendance at Riverside. I am very truly,

ELLWOOD COOPER.

One of America's noblemen is Prof. Wm. Saunders, of Ontario. These good men are busy men, hence we can not always have them with us. Here is a letter from one of our busy men:

OTTAWA, ONT., January 14, 1888.

MY DEAR MR. RAGAN: A protracted absence from home has prevented me from replying earlier to your kind invitation to attend your coming meeting in California. I regret that my duties at present, in connection with the work I have in hand, are so heavy that I shall not be able to leave home so soon again; and my time is so *fully occupied* that I have not just now a spare hour which I could give to the preparation of a paper for you. I sincerely hope that you will have a most successful and profitable gathering. I am truly sorry that I can not be with you. Yours, very sincerely, WM. SAUNDERS, *Director Exp. Farms.*

Of all the absentees, none are more deeply regretted than Prof. E. W. Hilgard, of the University of California. We had all hoped in coming to California to meet this most highly esteemed citizen. His absence is all the more a source of regret as it is due to sickness.

UNIVERSITY OF CALIFORNIA, COLLEGE OF AGRICULTURE,
BERKELEY, January 24, 1888.

Parker Earle, Esq., San José:

MY DEAR SIR—I had hoped that the attack of catarrhal fever that overtook me on Monday last would yield sufficiently to energetic treatment to enable me to be with you on Thursday at least, but although the worst is over, my doctor will not allow me to undertake any outside expedition or mental excitement, and so I must reluctantly relinquish the opportunity, which may not recur for many years, of seeing the Society at one of its meetings. I trust, however, that I may still have the opportunity of meeting a number of its members individually during their stay on the coast, and I would here repeat, most cordially, the invitation I gave to the members assembled at the rooms of the Board of Trade at San Francisco, on Sunday last, that they visit, severally or jointly, this university, and more especially the College of Agriculture, the usefulness of which has, unlike that of most others in the United States, been built up primarily on the experiment station work, among the subjects of which viticultural work is prominent; it being, in fact, the only viticultural experiment station in the United States, so far as I am aware. Communication from the city to Berkeley is half hourly—full hours and half hours—except during the middle of the day. It takes about an hour to get from the Palace Hotel to the university buildings. It will give me and my colleagues great pleasure to see the members of the Society, severally or jointly, at such times as may be convenient to them—only I suggest that Saturday

being a half holiday, it is only in the morning that the institution can be seen in operation on that day. Hoping that to see the turn taken by the higher education on its extreme western outpost may prove a matter of interest to many among you, I remain sincerely yours, E. W. HILGARD.

Mr. Hubbard, of New York, from the Committee on Order of Business, reported, recommending the daily meetings to be opened at 9 A. M., and 2 and 7:30 P. M.; that for this afternoon's session Prof. Husmann's and Mr. Ohmer's papers be presented; that each succeeding session's programme be reported at the preceding meeting, which report was concurred in, after which the Society adjourned to meet at 2 P. M.

First Day—Tuesday.

AFTERNOON SESSION, January 24

At 2 P. M. the Society reassembled in the Baptist Tabernacle, President Earle in the chair.

[NOTE.—As a matter of convenience in publishing this volume the Secretary ventures to change the order of arrangement of papers, preferring to publish the President's address here. [SECRETARY.]

PRESIDENT EARLE'S ADDRESS.

It was nearly fifty years ago that I had my first dream of an horticultural paradise as I read in the good old Bible story the report of that exploring committee which Moses sent out to search the land of Canaan, and spy out its resources, and "to bring back the fruit of the land." Now, Moses being the wisest of his race, and the greatest leader of men, did not ask his committee to bring back samples of the grain, the merino wool, the short staple cotton, or the best breeds of live stock, short-horns or Jerseys, but simply to bring back *the fruit of the land.* For Moses seemed to know that the country which could grow the best fruits was the very best country for the chosen people of the Lord to emigrate to. And when this first horticultural deputation returned laden with the figs, the pomegranates, and the great cluster of grapes from the banks of the brook of Eschol, that the two men bore on a staff between them—and I know that the cluster of grapes reached from the staff on the men's shoulders nearly to the ground, for my mother's great Bible pictured it that way—then Moses and Aaron and Caleb and the few wise men of Israel wanted to go up and possess the land, notwithstanding the sons of Anak dwelt there and the other tribes of great stature. But the mass of the people of Israel were ignorant, and did not appreciate this horticultural exhibition, and the promise of the better life that was possible in a fruit-

growing country, but they grumbled and rebelled; and they all suffered the righteous penalty for their neglect of such a noble opportunity. But I well remember the longing with which I considered that enormous bunch of grapes and the impulse I had to go and find a country where they grow grapes in big clusters. Now, I think that there are many thousands of men and women who were little boys and girls a little while back like myself—only a half century or so—who have been carrying visions of the great grapes of Eschol in their brains ever since those early Bible readings. And we have all been wanting to come to the land of Canaan ever since we found out where it was—that we might see its fabulous fruits hanging in the golden sunshine, and taste the perfumed air of its happy valleys, while we strolled along the banks of the wonderful brook of Eschol, and, perchance, find opportunity to lift some of those big grape clusters that are not wholly of the imagination.

THE EARTHLY PARADISE.

And so a few of us horticultural dreamers have come over the great fertile plains, across the thirsty deserts, and have climbed the gigantic walls which fortify you against invasion, to test for ourselves the climate and the fruits of this earthly paradise. We think we like the land and the fruits thereof, and shall make a good report of them to all the chosen people of Israel.

My friends of the land of Canaan, we are glad that we came. We are glad to be with you and to see the welcome which shines in all your faces. We come as fruit-growers, and gardeners, and forest planters, and builders of homes, to greet our brethren in a land whose conditions of culture we have long envied. We have come to study these new conditions for ourselves; to gain new ideas which we may apply where our surroundings are less favorable; to compare views as to many questions regarding which we have a common interest; and to drink with you at the fountains of enthusiasm which have inspired you to so many brilliant enterprises all along this golden coast.

HORTICULTURE.

Horticulture is a broad term. It covers almost everything that makes our country beautiful and sweet to live in. It embraces the operations of the fruit-grower, the skillful manipulations of the gardener, the arts of the landscape builder, and all that relates to the planting of forests in a land that perishes without them. Every horticulturist should be a missionary. He should be an educator of the public taste as regards trees and flowers and lawn plantings and fruit gardens. He should be an enthusiast for the beauty of his town. He should stimulate the making of parks, the adorning of cemeteries and school-house yards, the planting of groups of roadside trees. The true horticulturist will make his mark in the community in which he lives. I think that one of the great needs of the time is a generous enthusiasm for horticultural improvement. We want tree-planting associations in every town in the land. Every man should not only

make his own home beautiful, but should find some stimulus for his neighbor whose grounds are lean and bare.

The work that has been done by horticultural agencies in redeeming this great country, its towns and its farms, from the nakedness of forty years ago is something to rejoice in. The land is blossoming with beauty in thousands of parks and lawns and cottage door-yards; but many leagues of barrenness still stretch along almost all of our railways and highways, a vast field for the preacher of this new gospel of beauty and home comfort; and until every farm-house and cottage in all the length and breadth of this magnificent country shall be blessed by sheltering trees and blooming beds, or climbing vines, or some sweet spot of green turf which shows the outbursting longing of the immortal spirit for beauty—until every American farm shall have its garden for vegetables and fruit, and every village lot its fruit-bearing tree or vine, will the duty of the horticulturist as a teacher and a missionary be partly undone.

NARROW DISCUSSIONS.

I think it has often been a fault of our horticultural societies that their range of discussion has been too narrow. They have been given too much to the special interests which affected the business of the majority of members, and too little to those relating to the public welfare. In fact, we are often simply pomological societies or nurserymen's clubs. We come together with our great problems of culture, of insect management, of the cures for mildews and blights, and our whole business success is often involved in finding answers to these vexing questions, and we are prone to neglect the sweet influences which make for beauty alone and the refinement of the home.

I hope for an extension of all horticultural influences, for more societies, for more horticultural columns in the press, for social rural clubs and tree-planting associations, because I believe that the great horticultural movement of this age is doing far more for the higher civilization than all the factories and forges and trade guilds in the land. Let us labor generously toward that millennial day when every cottage shall shine with some of the beauty and every laborer's table carry some of the fruits of our art.

FRUIT-GROWING.

But while I would exhort everybody to grow trees and vines and plants for beauty and fruits for home supply, I do not by any means seek to influence any large increase of fruit-growing for commercial purposes, for I believe that fruit-growing as a business is increasing quite as fast as our facilities for distribution, and rather more rapidly than is profitable to the growers. It appears to me that there is no subject of more immediate practical interest to the commercial fruit-grower than this one of the means for a wide distribution. You are all well aware that our most important and

staple fruits often sell at ruinous prices in our leading markets, not only on particular days, but for long periods. The shippers of pears from California, of peaches from Delaware, of apples from Michigan, of strawberries from Illinois, and of oranges from Florida, can all testify to this. Yet I do not think that too many of either of these fruits of good quality have ever been grown in any of these states, nor enough for the markets that were within practical reach of them, or the mouths that were hungry for them. The fault is with our transportation, and our lack of any far-reaching and elaborate system of distribution. I think I have known good oranges to sell at not much over one cent apiece at wholesale in Chicago, the market being overloaded, when there were a thousand towns within a day's ride of that city in which you could not buy an orange for less than five cents—and not many at that—and millions of people within the same radius who did not taste an orange in the whole winter. Yet the fruit distribution from Chicago is more closely worked than from any other American city.

DISTANT MARKETS.

There have been many winters in which the price of winter apples has paid the producer very lean profits, and paid the large dealers more losses than gains, while at that same time an apple was a rarity, if not an absolute stranger, in half the farmers' homes and laborers' cottages in America. The delicious apricots of your Pacific coast are often left to decay in the luxuriant orchards that bear them for want of a market, while not one-tenth of the people of the United States ever tasted an apricot in their lives. Yet, by using the best modern means of transportation, your most delicate varieties, picked ripe from the trees and full of excellence—and not, as they are now for long shipment, too green to be of high quality—can be laid down in all of our great eastern markets in very perfect condition.

The same difficulty exists with most of our fruits. So many of our available markets are not reached; and the fruit-grower suffers from an apparent over-production when half the people go hungry for fruits which they need and can not obtain. This condition of trade is not found in the case of staple goods of other kinds, and manufactured articles; for all these goods are handled according to a more thorough business system. The more perishable nature of our fruits must of necessity modify and limit the same system of thorough commercial canvassing by which more durable products are placed constantly in every town and hamlet in the country; but I feel sure that regular fruit markets can be built up in thousands of towns that now get no supplies, except in the most irregular way, by an energetic system of canvassing. This subject demands the serious attention of our growers and dealers.

TRICKS OF TRADE.

This leads me to notice one grave reason why the building up of a regular fruit trade is more difficult than it should be. This reason is the irreg-

ular quality and serious imperfections of a majority of the fruits sent to market. Both the dealers and consumers soon get disgusted when they find half the peaches in a basket, or half the apples in a barrel, wormy; and in the case of the peaches find all of them green, hard and inedible below the top layer; and even the top course seeming ripe and well colored only when seen through the delusive tarlatan which is bound tightly over them. A basket of green peaches with a goodly supply of worms, and with sizable specimens placed on top, and then all covered tightly and beyond examination by a colored netting which makes them all appear blushing with ripeness, is a cheat and a fraud so contemptible and disgusting that it should consign the perpetrator of such a swindle to the tender couch of the county jail. It is only equaled by a barrel of apples that is faced up handsomely at both ends and is filled with scabby and wormy scrubs through the middle.

I regret to say that such baskets of peaches and such barrels of apples are forced off upon an innocent buying public by hundreds of thousands every year. I think and hope that the most abused fruit market in the world in this respect is that best of all the fruit markets of the world, the city of Chicago. I will venture the guess here that, of all the millions of people that have this year bought peaches coming through the Chicago market, not one in four has had occasion to bless the grower of the fruit; and in most cases he has been objurgated, if not cursed. I dwell particularly upon this kind of fruit and this kind of package because it is the most notable example of a widespread attempt to deceive the buyer to be found in all our fruit marketing history. It will not be a good excuse to say that red tarlatan is necessary to hold the fruit in place in the baskets, because *white* netting with a very open mesh will serve that purpose equally well and will not obscure the real color And no well-colored peach can be made more beautiful by any kind of covering. Is it any wonder that respectable grocers dislike to trade in our fresh fruits, and that the people get sick and weary of buying them, when the opening of every new package is the unveiling of a new deception?

AN EARNEST PROTEST.

I am a fruit-grower, a fruit-packer, and a fruit-buyer, and I stand here in all three capacities to protest, in all the earnestness of my soul, against all kinds of deception in fruit-packing. It is impolitic in the highest degree, and it is unworthy of all decent men. A large dealer not long since said to me that the whole business of fruit-packing, east and west, north and south, with now and then an exception, is worm-eaten, and rotten with dishonesty. My friends, I hope his denunciation was unjust, and I believe it is far too sweeping, but severe criticism is called for.

Let us away with all stuffings and facings, with all deceptive coverings, with all undersized packages, with the packing of all green, half-grown, gnarly and worm-eaten fruit in any kind of packages. If we must pack poor fruit, put it on top where it will tell its own story. Let us do this, and

we shall find that it will pay in money, pay in the plaudits we shall win from all men, and in our own self-respect and integrity of soul. I should say here, and I cheerfully do say, that I believe that the California fruit packers are generally far less open to criticism in this matter of straight packing than are the majority of eastern growers. You can not afford to pay freight on trash two or three thousand miles. Yet there is some room for improvement in the selection and grading of fruits from this pre-eminent horticultural state. It can not be too often or too earnestly impressed upon fruit men everywhere that to secure the best results the most scrupulous pains must be taken, not only in growing fruit properly, but in careful handling, thorough grading, and unflinching honesty in packing. The man with a high standard, well worked up to, is the man who will come out best in the race.

FRUIT PRODUCTION.

The business of fruit production is growing to be so vast a one in many sections of this country that the time has fully come for giving it more thorough organization than it has had before. There are many considerable sections of the country where it is already the overshadowing industrial interest, and it seems to me probable that in your great and glorious state of California it will soon overtop every other producing interest. For you, as for Florida and Delaware, and large sections of New York, Michigan, Illinois, Missouri, Georgia, Arkansas, and other states, these questions of transportation, distribution, a high standard of packing, and a high standard of quality of fruits, are questions of overwhelming business importance. The United States is the great fruit country of the world. There is no limit to the possibility of our fruit production when insect and fungoid troubles are handled by energy guided by science. There will be no limit to it except that of pecuniary profit. We can furnish the nations of the old world with fruit, as we do with bread and meat and cotton. There is no reason why the peaches of California and Mississippi and Michigan and Georgia should not be laid down in the European markets. I speak temperately, and my conclusions are based upon my own experience as a shipper of fruit. The facilities for doing this do not at present exist, but they are known, and within the reach of a properly organized effort. Hence, I see a future for the horticultural interest of this country that is glorious and vast as the blue canopy of a summer sky. To reach any grand and rewarding results every step must be taken with care and thoroughness.

MICROSCOPIC FUNGI.

Among the many obstacles to success in fruit-growing, the most destructive and most difficult to overcome are the myriad tribes of microscopic fungi which assail plant and tree and vine and fruit. There is no branch of our business which does not suffer serious annual losses from these obscure enemies, and no climate or section so fortunate as to long

escape their attacks. The discouraged fruit-grower who has lost his pear trees by the omnipresent blight; his peach trees by the insidious yellows; his grape-vines by the mildew, whose white shroud extinguishes all hope for fruit; his apple crop having become scabby, and his strawberry plants having been burned by the rust as by a consuming fire, turns his face away from the old homestead upon which all these horticultural curses have fallen, and travels to some new fair land where smiling skies and sweet winds promise him immunity from all these evils. For a few years these promises are kept, and his virgin crops are fair as the golden apples of Hesperides. But his obscure enemies follow him with the certainty of an avenging fate, and they will follow him the wide world over, even within the gates of Eden itself, if he does not wage an exterminating warfare upon them.

You can not probably name a fruit that we grow which is not preyed upon by four or five or more of these lilliputian foes. The number that affect the interests of horticulture can not be stated, but it is certainly counted by hundreds, a single one of which, like the scab on pears and apples, costs the American fruit-growers millions of dollars annually. I think it safe to say that the quantity of fruits entirely destroyed, or so seriously defaced as to lose their market value, in this country by these low forms of vegetable life is far greater than all that escapes their attack. This difficulty grows greater year by year in all fruit-growing neighborhoods. That this is a situation which demands the serious attention of all horticultural people I need not suggest.

LACK OF KNOWLEDGE.

Our definite scientific knowledge of the nature of this vast underworld of microscopic life, which pervades and attacks and overwhelms all the higher and nobler forms of vegetable organism, is as yet incomplete, and is all very modern. It is the most obscure domain of physical research. The botanists who have thoroughly studied the fungology of this country, and have done something to master its elusive problems, can be almost numbered on the fingers of the two hands. We have thousands of scientific men, and hundreds of specialists, who are making plain paths through the intricacies of scientific obscurity, but this great and universal realm of the infinitely little things which attack all superior creations, and assail the integrity of every structure which enters into our civilization, has received little investigation.

What we need is more workers in this field. We must have more knowledge, and that we may have investigation we must provide in some definite way for the support of it. Is there any more important kind of work for our agricultural colleges, and for our state experimental stations? I urge this matter upon your thoughtful consideration.

A NOBLE OCCUPATION.

The business of fruit-growing is one of the noblest occupations of the

world, if carried on with a faithful spirit. The results of our work contribute directly and powerfully to the betterment of mankind. We minister to the health and the moral stature of the community. I would have every horticulturist regard his vocation with becoming pride. We work with the great forces of nature. We form alliances with the sunshine and the rain, and the secret affinities of the soil. We manipulate the occult energies of chemistry. We join hands with Providence to produce our harvests. The American fruit-grower, like the American farmer, should hold his head proudly, but reverently, as the best man of the world. As I look at it, there is no man on earth that outranks the well equipped and competent American farmer and American fruit-farmer. But equipment of knowledge and intellectual competency mean a great deal.

THE NEED OF BROAD CULTURE.

The successful and ideal farmer must be a man of culture and of science, must have a wide knowledge of the world, its great industries, its history, its commercial needs. He must be a power in the community and in the state. Are we taking the necessary educational steps to produce such farmers? There is no question which a convention of horticulturists, representing every section of our country, can more appropriately consider than that of the facilities we are providing for the education of the American farmer as he should be. We have the foundation for the best educational system of any nation in the world, and we have a more earnest general desire to find the best kind of education. Our farmers and our agricultural writers are more widely imbued with this desire than this same class in any other country.

Yet I fear that the present tendency is to place our standard too low. I am greatly in sympathy with our agricultural colleges and with the industrial departments of our universities, but I can not join in the general criticism of those institutions which attempt to give a generous literary culture as well as a good technical training. In fact, I feel like protesting earnestly against the general trend of the discussion in the agricultural press toward a purely technical, manual, industrial education.

The American farmer should be the most liberally educated and broadly cultured man in the American state. The farmers as a class far outnumber the class of manufacturers, or of merchants, or of professional men, or of all these classes together, and yet they have less influence in molding the industrial and political policies that govern us than either one of these other classes. Why is this, except that the farmer has learned how to plow and to mow and to dig ditches better than he has learned how to think? His education has been too generally confined to those rudiments necessary to give him practical success as a farmer in a narrow sphere. And here come the doctrinaires of the new industrial education and propose the same policy for our agricultural colleges, only in a larger degree.

This wide-spread sentiment is, it seems to me, one of the saddest mistakes of the age. It proposes an education as deficient in general mental culture as the old classical schools are lacking in scientific and technical training. The true education that will make broad-minded, forceful men of our bright boys must embrace all that is best and all that is possible of both the old and the new systems. Let us by all means shed all the light of science on the difficult problems of agriculture—let us teach engineering and drainage and stock management and veterinary practice; but let us not try to eliminate the Latin from the nomenclature of science or go into editorial spasms at the sight of a pile of Greek roots.

I believe that the farmer will never take his proper place as a director in great affairs of economy and statesmanship until he is educated as the lawyer, the minister, the physician, manufacturer, merchant and statesman are educated; until he becomes a student, if not a master, in all lines of classical, literary, æsthetic and scientific culture, as have the controlling men who gauge our policies and direct our affairs. The plea so earnestly and frequently made against classical and literary teaching in our agricultural colleges is a plea for mental narrowness and intellectual incapacity. The technically educated farmer may guide the plow to turn the truest furrow, but he may not be able to do much good in holding the helm of state. Facility in forging plowshares, in turning the parts of an engine, in grafting and training fruit trees, in the economical care of stock and the treatment of sick animals--all these accomplishments so essential to the artisan and the farmer as such—nevertheless fail to qualify him for the higher social duties and the solemn responsibilities of the citizen who should be foremost of men in controlling the great policies of the commonwealth. In fact, a well trained faculty for tile drainage is not a liberal education. Cincinnatus was called from the plow to the chieftaincy of a people, not because his hand could hold the plow well, but because his educated brain could master the great problems of the state. The men who have made farming and horticulture a noble occupation, who have given dignity to labor, who have voiced the needs of agriculture and the longings of industry, are not the men who have had simply a dexterous manual skill, but they are men whose minds have had that generous training and culture in all the learning of the ages, as well as the science of to-day, which have given them a masterful position among the best men of the time.

FORESTRY.

I should be recreant to the duty of this hour if I did not call your attention once more, as I have often done before, to the commanding question of forestry. To one who has watched the deforesting work of one generation of men in all the woodland portions of this country, and noted the gradual change of climate from one of mild conditions to one of extremes as the great conservative forests have disappeared, it would seem that no appeal

should be necessary to arouse every class of thinking men to take some immediate action to arrest the threatening waste of our forests and to rebuild these faithful guardians of climate and soil. There is nothing better established in physical science than that a good proportion of forest is necessary to maintain equability of climate. It is conceded by scientific men, and sustained by practical experience in many countries, that as much as one-fifth or one-fourth of the land should be in forests to secure the greatest aggregate of agricultural crops. I can not stop to discuss the philosophy of this statement, but the fact will scarcely be questioned. There are several of our states that have passed the limit of safety in timber waste; but the work of woodland destruction goes on with remorseless energy. I can name you states where nearly or quite one-half of the total area of land has been laid bare of forest growth in about a quarter of a century. Some of them have not five per cent. of their valuable timber left; and so far neither the nation nor any state has made any serious attempt to stop the waste or to promote forest culture. The governments of other countries show much more wisdom than we. The European governments live in the immediate presence of the ruin and national decay that have come to once fertile and populous lands. The institutions of civilization have never declined in a country that has maintained its forests—I think I can safely say that they have never been maintained in any country that has wasted its woodland heritage without repair. Hence, these enlightened governments have been long taking the most vigorous measures to conserve and to restore the great protective agency of the green and glorious woods.

It is the clear duty of our general government to absolutely prohibit the further slaughter of the timber on its domain, and to withdraw all forest lands from sale except to meet the pressing needs of settlers. And why should not this government take similar measures to those taken in the old world to establish forests on treeless public lands? And can not our state governments encourage timber planting by a judicious system of bounties and arrest its waste by a very heavy tax on timber cutting? By some such plan, or by *some* plan, the states should take prompt action for the upbuilding of forestry; and no graver responsibility rests upon our legislatures than this.

THOSE GONE BEFORE.

There is one sad duty remaining to me on this occasion: to announce the names of two friends who have passed onward beyond the reach of mortal vision. This society had no more zealous member, and horticulture no warmer friend, than A. C. Kendel, of Cleveland, Ohio, who died during the last autumn. Many of our members mourn his loss as that of a brother. Mr. Kendel was one of our largest and most useful fruit merchants, and was one of the class whose faithfulness and integrity all men praised. He was the affectionate head of a devoted family; he was active in every good work for helping his fellow-men; he was in all places a gentleman, and in all the

relations of life the soul of honor. In the death of such men in the maturity of their powers society suffers a great loss. We who knew him well will never know a better man.

The death of Colonel Marshall P. Wilder, the venerable president of the American Pomological Society, although not unexpected—for he was eighty-eight years old—yet cast a certain sorrow over the entire horticultural world. For half a century he had been at the head of American pomology. His fame was world-wide. Boston has been the home of many great men, but she had few citizens of such stately presence as our noble friend. President Wilder had a kingly aspect and bearing, but he had a queenly heart, as gentle and true as your own mother's. None knew him but to admire him and to love him. He lived out a great and well-rounded life here, and he has gone forward to those happy uplands where frosts wither not nor blights destroy the immortal fruitage on the heavenly hills.

DISCUSSION ON THE ADDRESS OF PRESIDENT EARLE.

Mr. Johnson, of Indiana—I move to refer the address of President Earle to a committee, with instructions to report upon some of its special features. Motion carried.

The committee was made to consist of Mr. Johnson of Indiana, Mr. Ohmer of Ohio, and Treasurer Evans of Missouri.

Mr. Smith, of Wisconsin—I wish to give my heartiest indorsement to what our President has said about packing and shipping. I have had a great deal of experience in packing and shipping both fruit and vegetables, and though I have been in competition with Chicago, where they can and do sell cheaper than I can, yet I have held my own and built up a trade because I have always been very careful what I packed and how I packed it. If I sent any fruit which was not fully up to the standard I always packed such fruit by itself and sold it as low grade, instructing the commission merchants at the same time to sell it for what they could get and to pay me whatever they thought it was worth. I have found this system to work well, and I have by this means built up and kept my trade.

Mr. Kinney, of California—I regret that the President has given the weight of his name against technical and industrial schools. No doubt where he comes from there may be too much industrial in proportion to literary and classic training, but in this state it is the reverse. We have just commenced our industrial education

here, and are finding it difficult to get technical training introduced. Nor can I agree with you, Mr. President, that our greatest men have had a liberal education. If great men were those who have had classic educations, then those who have stood highest at the universities would stand highest in the national councils; but it is not so.

President Earle—I did not mean to imply that a college education was a liberal education, or that graduation from a classical college gives a better training than graduation from a technical college; only the tendency is now, in the east, to throw out liberal studies altogether, and to make our schools more and more technical and practical, to the exclusion of all literary studies. I wish to have the question discussed, and will be glad to hear any criticism, but I stand by the words and sentiments of my address.

Dr. Kimball, of California—This is a time of material and technical training, and not a time of training in higher and better things; therefore, I was very glad to hear the words of the President urging the needs of a greater and wider classic culture. I think the address was particularly needed just at this period, and that its expressions were fit words spoken in season, and hope that it will not be changed.

Dr. Plummer, of Oregon—I am particularly pleased with what was said about packing and shipping. I am in favor of the most stringent laws to punish those who are dishonest in these matters, for every person ought to be able to get fruit in good shape. But I can not agree with what the President has said about laws against destroying timber. I think it unwise to send a memorial to congress on the subject, as it is impossible to make a general law that would not be injurious to some parts of the country. In Oregon it is necessary to destroy trees in large numbers, for in that state there are localities where timber is not worth anything at all; there are no mills at hand to saw it into boards, nor any villages where it can be sold for firewood; it encumbers the ground, and in order to clear the ground for cultivation it is necessary to destroy it; and so it is in some other localities. This country is too diversified for a general law; each state should be left to itself in this matter.

Dr. White, of California—I am opposed to those who would lower the standard of classical training in our schools. I am sure that no man who has had the benefit of college culture would sell his education on any terms. The great men of our country, like Henry Clay, who have not had these advantages in youth, have, in their mature years, devoted the native energies of their hands to make up by study what they lacked, and they have all expressed regret that they did not have these advantages in youth. Lincoln did so, and so has every great mind. Our colleges should be united, so that the intellect may be more fully developed, and any of the students who wish to enter upon any special course of technical knowledge will find themselves better able to do so by reason of this higher and finer training of their intellectual faculties. I trust the President's address will not be modified.

Mr. Munson, of Texas—Terraculturists require technical knowledge. Botany, chemistry, mineralogy, entomology, ornithology, each must be known to him in its scientific nomenclature, for common names would lead to confusion, since the common name of a particular bug in one locality is very often the name of a distinct bug in another place. He need not be a Greek or Latin scholar, he need not be even able to read Latin or Greek, but he must know enough of these things to understand the nomenclature of science, otherwise he could not write, or scarcely read with intelligence, a single treatise on any one of the departments of agriculture or horticulture. But he must also be practical, and not waste much time on Greek and Latin. In the right education of the horticulturist science and technical training should unite.

Mr. Van Deman, U. S. Pomologist, Washington, D. C.—I am very sorry, Mr. President, that Mr. Fernow, chief of the Bureau of Forestry, is not here. The forests ought to be saved. Even those trees of which the gentleman from Oregon spoke, which are now far out of the way of the markets of the world, will soon be in the market, and the trees will have more value than the land, and it is selfish in us to destroy and waste now what will soon be of great value to those who come after us. Congress ought to withdraw from settlement all wild lands which are remote from roads and not now needed, and save them until widening civilization renders them

valuable to us. California has the largest forest trees in the world. The grandest and noblest trees on earth are the redwoods along the Sierra Nevadas, which are now being ruthlessly destroyed, and I trust this body will send to Washington resolutions urging that action be taken to stop the wasting, that these grand old woods may be saved for our grandchildren.

Prof. Husmann, of California—I regard the preservation of our forests as a matter of the greatest importance, and legislative enactments for that purpose as a dire necessity. I was surprised at the remarks of my friend from Oregon. It may be that in a few places there are too many trees, but all along our coasts can be seen the desolation wrought by the destruction of the trees. I regard the redwood as providential to this climate. We need it in grape-growing to furnish stakes for our young vines. It is one of the best of building woods and one of the least perishable, and it has great powers of reproduction. Whenever a tree is cut down suckers immediately spring up from the roots, and in twenty or thirty years furnish good strong wood for all purposes. This noble wood should be saved; it should not be cut down for fuel, and the roots should not be dug up. The root of the tree, having a most beautiful color and grain, when polished is very valuable, and so the very roots are being destroyed. But the greatest destruction is from fires left by careless hunters on the mountain-side.

Secretary Ragan, of Indiana—From the remarks of Dr. Plummer, I infer that the farmers of Oregon are now passing through that period of forest-vandalism, if I may use the expression, so recently existing in many portions of the east, where arguments for the destruction of forests had numerous advocates. "We were early taught," said Rev. Mr. Webster, of Ohio, before this Society at a recent meeting, "to destroy the noble forests. My father, in my earliest recollection, on this Western Reserve, used to say: 'There are three arguments for keeping a good fire: to get rid of the trees, that we may keep warm, and that we may have more ashes to sell.' When the first church, of which I now have the honor to be pastor, was being erected, many of the subscriptions were marked, 'to be paid in ashes.' Ashes were better than grain, and were a 'legal tender' in the payment of the pastor's salary."

But, Mr. President, that happy day has long since vanished from the great eastern plain of this continent, and timber now has other and higher values than to be consumed for its ashes, chief of which is the modifying effect upon climate of large bodies of forest lands. I have scarcely passed the meridian of life, and yet I can distinctly remember when all the hardier fruits of the orchard succeeded admirably in the central basin of the Ohio valley, where to-day we are strangers to such luxuries, and this is, in my judgment, largely due to climatic changes incident to civilized man's interference with the equilibrium of natural forces resulting from an equitable distribution of forests. But, like children, we must learn by experience, and I presume our Oregon friends are now being schooled by that same inexorable master.

Mr. Kinney, of California—Forestry is a subject of vast importance to California. The mountain woods of Southern California are closely related to water supply, and an abundant water supply is the life of our land. Destroy our mountain forests, and the water is changed from a beneficial to a destructive agent, as is proved by the history of Southern Europe. In the valley of Durance, in France, more than 130,000 acres of once fertile lands are now desolated by rocks and other debris washed down from the denuded mountain-sides. This matter is of such vast importance that I move that a committee be appointed to draft a memorial to congress on this subject.

The motion was adopted, and the committee made to consist of Mr. Kinney of California, Dr. Ridpath of Indiana, Mr. Paulsen of Oregon, Mr. Smith of Wisconsin, Mr. Munson of Texas, and Mr. Hubbard of New York.

Mr. Paulsen, of Oregon—I am opposed to sending any such memorial to congress, since no universal law would do justice everywhere. With us in Oregon it is necessary to destroy trees by the cheapest and speediest method possible. Our climate is remarkably favorable to the growth of trees, and if a forest be destroyed and the land be let alone in less than sixteen years the trees will all be grown again. We have to fight against the woods, and in our section of Oregon we will never need any tree planting. I speak of Western Oregon, for in the eastern part there are extensive prai-

ries; but with us we are opposed to any law that prevents the destruction of forests by the cheapest and quickest method possible.

Prof. Lemmon, of California—I am a botanist, and I indorse the speech of the President, as I do not think our western forests grow too rapidly, except in a very few localities. All along our coasts can be seen a saddening sight of desolation brought about by the greed of those who own the summits of our mountains.

Prof. Ridpath, of Indiana—The note of warning sounded by the President ought to be heeded. I was born in a noble woodland that has been destroyed; those who destroyed it gained little, but we are sufferers now. In my boyhood the air was humid, and I remember hearing an old man say that he had once, on a summer's day, ridden along through the moist air in the shade of the trees and said to himself, "There will never be dust in Putnam county;" but if you could see it now you would never think it could have been anything else. All our moisture has gone with the trees. This destruction of trees has changed Asia Minor into a desert land; even Oregon will see the thing in the future. As for the pests which follow civilization, we can meet and overcome them by science; their propagation depends upon conditions which, when accurately known, can be removed, for man is master of them. Just as cities can banish all zymotic diseases when they unite energy with science, so can we remove these microscopic enemies from our orchards. Buckle remarks that happiness depends on our knowledge and mastery of natural laws, and when we know a little more about these pests we can overcome them. I think the President is right in his views on education; we need a higher classical culture.

President Earle—Forestry will be before the meeting again, as we have an essay from Mr. Fernow, Chief of the Bureau of Forestry, and also Robert Douglas, who will meet us at Riverside, will read an essay on the same subject. I believe this to be the most important subject that will be before us at this meeting. Let us pass to the subject of grape culture. Prof. Husmann, of California, will now present his paper.

THE OUTLOOK OF AMERICAN GRAPE CULTURE.

BY PROF. GEO. HUSMANN, OF CALIFORNIA.

You have demanded from me a paper on the subject of "The Outlook of American Grape Culture," and wish me to consider it from a general stand-point, eastern as well as western, giving short and cogent reasons for what I believe. To those of your members (and I need not say that there are many) who have been familiar with my exertions and labors in the cause of American grape culture for the last thirty years I need not state that my faith in the ultimate success of a calling which I entered with diffidence, but which grew upon me until it became a hobby and a passion, has been unwavering and steadfast; that even in the darkest days of the young industry I adhered to it, with a love that will never die until that greatest of all Vintners, who said, "I am the vine, ye are the tendrils," sees fit to call me away from the task.

But I confess that I hardly consider myself competent to speak of the prospects of eastern grape culture. When I left Missouri, in 1881, I was conversant, if not identified, with the progress that had been made there, with new varieties of native grapes as they appeared and were tried, and could speak more understandingly than I can to-day. Here, while still cultivating many American varieties, I found different climatic conditions, which evidently have an unfavorable influence on the fruit of most of the American varieties, while their influence on European varieties is highly favorable. Such varieties as were our mainstay in Missouri and the east, as, for instance, Norton's Virginia and Cynthiana among the Æstivalis, Elvira and Missouri Riessling among the Riparia, are valuable here only as stocks for grafting the vinifera, and almost worthless for direct production. Yet it is from the native American stock that you east of the Rocky Mountains must obtain the elements of your grape culture and base your hopes for success. You can not grow the vinifera species in open air, as they are too much subject to the changes of your summers and the cold of your winters to place any reliance on them. With such men as Munson, Ricketts, Campbell, Rommel, Jaeger, and a host of others, directing their best energies to the production of new seedlings from Æstivalis, Riparia, Cinerea and Rupestris, with the encouraging progress already made, the day is certainly not far distant when you will have varieties that will be productive and good enough, both for table and wine, to fill your markets with desirable table grapes, and also furnish wines good enough and cheap enough for home consumption. I have faith in the future of the American grape, and believe that it will not take as many decades to develop desirable varieties as it has taken centuries to develop the best vinifera species. But the climatic conditions of the eastern continent seem to be constantly changing; varieties considered entirely reliable only five years ago now seem to be failing, and my eastern brethren are better competent to judge how far they

can hope to compete with foreign productions, or the product of the western coast, which must place its main reliance on the vinifera class. That each locality will have to experiment for itself until it finds the varieties entirely suited to it seems to me self-evident. In any event, the present time would seem the most propitious. When France has dwindled, through the ravages of phylloxera and from other causes, from a production of over 2,000,000,000 gallons of wine to not enough to supply her home demand, and must rely on Italy, Spain, Hungary, and still more on the skill of the wine doctor, to keep up her trade, while the ravages of the insects are felt in all the wine-producing countries of Europe, it would seem a good time for the universal American nation to step in and assume its part of the world's wine markets.

And every locality at least should grow its own table grapes. The grape is the healthiest of all fruits, and should be eaten and enjoyed by every one in this nation, which threatens seriously to become a nation of dyspeptics. We want grape cures established throughout the land, just as they are on the Rhine and other streams in Germany, where the tired city merchant and his family can go from the heat and impure air of the cities to recruit up in pure air and on a daily diet of fresh grapes. While horticulturists, as a rule, are among the healthiest of men, just because they have more or less of fresh fruit every day, the nation as a whole is, perhaps, the most dyspeptic on the globe, and were it not for the constant admixture with foreign elements, which bring new life to it, it would become hopelessly so. It is, therefore, not a question of profit to the grower merely, but of vast national importance and welfare, that we should have grape cures established in every grape-growing community, and these alone would use up a large amount of fresh grapes.

When we come to the consideration of the question here in California and on the Pacific slope I am more at home, and can speak more understandingly. I know what I say when I claim that we can raise grapes profitably at $15 to $18 per ton, and can make wines good enough to compete with the choicest European brands, nay, even surpass them. If our best brands have not been so generally produced or disseminated as to establish the name and fame of California wines as they deserve to be, it has been simply because the industry is very young yet, was commenced with inferior varieties, often manipulated with little or no skill, and our wines came upon the market in an immature condition. Our industry is too young yet to have come near perfection. We need better average wines than we have had so far; we want different methods than have been employed to bring them before the public; we want wine storage houses, which will enable the vintner to put his product where it can be matured, and a more uniform grade established; we must come to the conviction that our inferior wines had much better go to the still, or be manufactured into vinegar, than be imposed upon the public as California wine, and ruin its reputation. But we have already enough of really good wine to stand upon its own merits. We should despise the trickery of sending it under French and German

labels, which so far has mostly been done with our best products, for which France and Germany received the credit, while we received the blame for the inferior article. We claim, and claim justly, that we can make wine—the pure, unadulterated, fermented juice of the grape—good enough and cheap enough to make it accessible to every laborer, every family, in the Union, while we also know that we can produce quality high enough to please the nicest connoisseur. And we also claim that in so doing we are furthering the cause of *true temperance*, not total abstinence, but a temperance that enjoys the noblest gift of God to man in the whole realm of horticulture with moderation; which drinks wine as it ought to be drank, to "gladden the heart of man," and to cure our oft infirmities. We claim that it can and should be introduced into every household, taken with every meal, as a pure and healthy stimulant. I speak now of pure light wine—wine with a natural combination of six to seven per cent. of acids and from two to three per cent. of fruit salts, tannin, etc., ten to twelve per cent. of alcohol, and something like eighty per cent. of water; not of the sweet Catawbas, angelica, sherry and ports, when the ardent spirits they contain are disguised by sugar, and which are as unwholesome as alcoholic liquors, if not more so. The wine I speak of, the fermented juice of the grape, is healthy and health-inspiring; it does not originate the craving for ardent drinks that is the bane of so many households. I have brought up a family of four girls and two boys; they have had free access to wine every day of their lives; the oldest has charge of 600,000 gallons of wine now; and not one of them has ever become intoxicated on wine yet, nor have I any fears that they ever will. They use it daily, but never abuse it; use it in the way in which our Savior intended to have it used when He made it for the guests at the marriage feast at Cana, and instituted it as one of the sacraments, to be partaken of in remembrance of His last supper. Do we need a better and holier example to consecrate our calling than this?

Let our nation follow in His footsteps, make pure light wine the universal drink, and we will not see so many filling drunkards' graves as we do to-day. If we can furnish good, wholesome light wine at twenty-five cents per gallon here in this state, and at thirty-five to forty cents per gallon in the east, it becomes a cheaper beverage than tea or coffee, and a more wholesome one. We do not want the saloon-keeper as middle man to sell wine at four to six dollars per gallon which cost him thirty cents. But we want a family supply at that price, and every family in this state can have it if they try, and get five gallons at a time, take it home and enjoy it at eight to ten cents per bottle. Our mission is a mission of *reform* in its best sense; we want to supply the people with the cheapest and the best of beverages, bring roses to their cheeks, elasticity to their steps, and health to their old age; and I care very little for the decisions of supreme courts, and exclusive laws of individual states. I believe too much in the sound good sense of the American nation to suppose that Maine or Kansas laws can fetter the free agency of any man, as long as he keeps within the limits of a blameless

private life. All of the so-called prohibitory laws will not prevent the free American citizen from drinking a glass of pure wine if he thinks it conducive to his health and the well-being of his family. You may as well try to prevent the free air of his own country from fanning his cheeks as lay fetters upon his actions or his convictions. They will assert themselves, and he will drink wine if he thinks it is to his benefit and that of his children. The choice only lays between our own native production, purer and cheaper in every respect, and the imported article, at a higher price and with no assurance as to its purity; and then, again, I hope we are getting beyond the narrow prejudice of "far fetched and dear bought" to stand on the simple pretext of turning up our noses at home products, to prefer French or German brands just because they cost three times as much. The cause of true temperance, of home industry, will triumph in the end.

When we come to look at our raisin industry, the case is still more simple. Here we may say we have a monopoly; from the small beginnings years ago, we have worked up to the production of a million of twenty-pound boxes in 1887, and the brands of California packers are now preferred to the foreign product, not *because* it is American product, but *against* all the prejudice engendered by long usage of the foreign article. Now our raisins are driving the finest of foreign manufacture from our markets, and are sold almost before they reach eastern markets. If we once come to the day that all of this immense country uses California raisins, *because they are cheaper and better*, in preference to the imported, what an immense field is opened to this industry! Here is an area which even all those may enter who have conscientious scruples against wine-making. They can thus dry their fruit, and find a ready market for it in this country as well as on the continent.

You are aware that we are now supplying the eastern states with table grapes to a large extent; with our increased shipping facilities we can continue to do so. I need not say that they are larger and showier, and many also prefer their flavor and their firmer and more pure meat to the American varieties. This is a matter of taste; and as we can also keep them longer, and many of our mountain districts are so free from frost that they can remain on the vines until January, this again opens a large field for profitable grape culture. We have hardly begun to develop all of our resources, and can hardly tell yet how far this may become a profitable and pleasant industry. But there seems to be little doubt that the supply of fresh grapes can be kept up until March, or even April.

I have tried to give you a brief outline and some of the reasons why I believe the outlook for American grape culture a bright one. But to develop all these branches of our young industry they need the fostering care and protection of our government. While we can be more sure of a crop, and of a more uniform product, than the European vintners, they have the advantage of us in cheaper labor; and although we have brought the ingenuity of the universal Yankee nation to assist us in labor-saving machinery, yet we can justly ask a remunerative price for better and purer goods than

they can and will supply us with, and we can only obtain this if we are protected against foreign importations by a tariff, not exorbitant, but sufficient to put us at least not at a disadvantage with foreign competitors. I have tried to give you a brief outline why I have faith in the ultimate success of grape culture. If I was not afraid of tiring your patience, I would give you twenty pages more, but I give way to abler pens and brighter, more entertaining discussions.

With an unbounded area adapted to successful grape culture, with the results already obtained, which are certainly encouraging enough, I can see no reason why this continent should not become the Vineland of the old legend, and its inhabitants the freest, the most sober and happy among the galaxy of nations. I have abiding faith in the ultimate result; and though it may be but the dream of an enthusiast, and I may not live to see its fulfillment, I shall believe in it through good and evil to the end of my existence.

DISCUSSION ON PROF. HUSMANN'S PAPER.

President Earle, of Illinois—I trust that the importance of the subject of grape culture will be fully recognized by members of this Society, and as it is now so ably presented to you by the paper of Prof. Husmann, I shall expect of you a lively discussion of the topics opened up by the writer.

Mr. Hubbard, of New York—The conditions of grape culture in California are radically different from those east of the Rockies. I can most heartily agree with Prof. Husmann on most points. I prefer, however, to use my grapes in their native state rather than when manufactured into wine. In my state grape culture is rapidly increasing. There are hundreds of acres now being planted where ten and twenty acres would have been thought sufficient a few years ago. There are certain sections of New York where grape-growing is very successful. Our yield is from three to four tons per acre, and the price for which they are generally sold is from two to three cents per pound. The Concord is the most profitable variety, the Catawba next. Eastern methods of packing and shipping grapes to market are very different from California methods. We ship almost altogether in ten-pound baskets which are of such shape as to pack closely and securely in the cars. These baskets cost about three cents each, and are sold with the fruit. They pack in such a way as to thoroughly ventilate all portions of the car. The fruit should be exposed to the air for a day or two after

picking before packing, so as to slightly wilt and toughen the skin and stems, when they may be safely shipped a distance of several hundred miles.

Mr. Hatch, of California—What is the freight rate on grapes from your section to Denver?

Mr. Hubbard—The rate to St. Paul, St. Louis and other Mississippi river points is about one-third of a cent per pound. I can not say just what it would be to Denver.

Mr. Wilcox, of California—What kinds of soil do your grapes succeed best upon?

Mr. Hubbard—On almost all of our good farming lands, if well located. They do best in the vicinity of bodies of fresh water, as our inland lakes, and bordering on the Hudson river. The shores of Lakes Geneva and Canandaigua are noted grape regions.

The President—Mr. Hubbard, what is the probable acreage of New York vineyards?

Mr. Hubbard—Probably thirty or forty thousand acres are devoted to grape-growing in the state of New York.

Mr. Smith, of Wisconsin—In regard to freight rates, I would say that a car of vegetables from Green Bay to Denver costs about $400. I presume it would be the same on fruits.

Mr. Durand, of Missouri—It costs us forty-five cents per hundred to ship apples from Kansas City to Denver by the car-load.

Mr. Hatch—Freights are much higher in proportion from here to Denver than are through freights to Chicago.

President Earle—It is quite evident that the railroads are trying to starve the people of Colorado in the matter of fruits.

Mr. Buck, of California—Mr. Hubbard, is there any great proportion of the New York grape crop manufactured into wine?

Mr. Hubbard—Probably less than one-fourth of our crop.

Mr. Smith—I understood Prof. Husmann to say that California grapes sold for from $15 to $20 per ton. I should like to know if they can be profitably grown at this low rate.

Prof. Husmann, of California—A fair average cost of cultivation, including pruning, etc., is $20 per acre. The yield ranges

from three to ten tons per acre, owing to culture, soil and other conditions. You can readily see that this leaves a fair profit to the cultivator.

Mr. Combe, of California—Prof. Husmann has, if any odds, given you a high estimate on the cost of cultivation. Grapes are grown in this (Santa Clara) county for less than half the sum he names. Labor is cheap in California, and good wine grapes may be grown at a cost not exceeding $8 or $10 per acre. We need greater experience and more capital invested in the wine industry in California. Our wines, as a rule, are sold too early. They should have more age before being sold, when the product will not only be far better, but will bring better paying prices.

Mr. Buck—In answer to questions, I would say it is quite difficult to give the exact amount of fruit, exclusive of oranges and lemons, shipped from California to points beyond the mountains. From the best estimates at hand, I think about 1,700 car-loads were shipped last year, 300 of which were grapes.

Mr. Blackwell, of California—Mr. Crabbe, an intelligent vineyardist of Napa county, claims that he can raise grapes at less cost per acre than the farmers of the central states can corn. He also says he would rather cultivate grapes at $10 per acre than wheat at two cents per pound, and that good wine can be profitably made at fifteen cents per gallon.

Mr. Buck—Wine grapes can be grown more cheaply than table or raisin grapes. Mr. Crabbe is good authority, but I fear he underestimates the actual cost of good wine when he puts it as low as fifteen cents per gallon.

Mr. Wilcox—Mrs. Dr. Headen, of Santa Clara, has a six-acre vineyard of table grapes, the crop of which last year netted her $2,500. The Muscat, White Tokay and Rose of Peru are excellent table varieties.

Prof. Husmann—The cost of raising grapes varies greatly, owing to location and surrounding circumstances. There are many methods of culture and numerous varieties of grapes. Mr. Crabbe himself has over 300 varieties in cultivation.

Prof. Thomas, of Arkansas—Is the Scuppernong grown in California?

Prof. Husmann—It is grown to some extent, but is not profitable.

Mr. Munson, of Texas—My experience in grape culture is entirely confined to American species. The grapes grown so successfully on this coast will not succeed east of the Rocky Mountains. American grapes have been greatly improved within the last few years. There are several species of native grapes from which our cultivated varieties have originated. These are being crossed and hybridized with each other, and many fine varieties are being produced. Many of these new varieties are fine table grapes, and others produce the best of wines. Hermann Jaeger, of Southwest Missouri, has originated a number of fine varieties from the native grapes of that region. Owing to the ravages of phylloxera in France, our native vines are being imported to supply stocks for their vines, as these native varieties are phylloxera resistant.

Mr. Smith—Grapes can not be profitably grown in Wisconsin at the low figures here talked about. Wisconsin can scarcely be considered a grape-growing state, and yet we raise some very fine fruit. I live on the shore of Green Bay, and there many fine varieties succeed. The Fox River valley also produces fine Delawares and Concords. The Worden is rapidly gaining popularity. In point of quality, the Delaware is the *ne plus ultra* of table grapes. I sold my last year's crop of Delawares at eight and ten cents per pound. We can grow grapes profitably at three cents per pound. Stable manure and wood ashes are the best fertilizers for the grape.

Mr. Lindley, of North Carolina—Our grapes ripen early, and bring us better prices than I have yet heard mentioned. Prices range from ten to twenty cents per pound, or $200 per ton. Bone-dust and wood ashes are our best fertilizers.

President Earle—Minnesota took the first prize at New Orleans for grapes. I should like to hear from some Minnesota grape-grower.

Mr. Wilcox—Where was California?

President Earle—She stood by herself, no other state daring to compete with her.

Mr. Grimes, of Minnesota—Minnesota is not particularly a

grape growing state, but in many sections, especially around Lake Minnetonka, they were very fine. At the beginning of the season, before ours are ripe, our supplies come from the more southern states; but as soon as Minnesota grapes are upon the market those disappear, or, if the merchants happen to have any on hand at that time, they are disposed of for what they will bring, ours being fresher and better. I do not want to boast of what we are doing, but I will say that at the centennial, in 1876, I was astonished at the California display of grapes; but you men seemed to be looking more after the dollars than anything else, and kept selling and replenishing from fresh arrivals of fruit from day to day; but it so happened at the very time the awarding committee came around your tables were almost depleted, and Minnesota took the prize. Also, at the last meeting of the American Pomological Society, held at Philadelphia, we took the Wilder medal on grapes, and also the first premium at the cotton exposition and world's fair recently held at New Orleans.

Mr. Budd, of New Jersey—New Jersey has two grape-growing centers—Vineland and Hamilton. The Hamilton grapes are largely converted into dry wines, while those grown at Vineland are generally sold in their natural state, New York city being the principal market. The Concord and the Ives generally bring from three to four cents per pound. Mildew and rot sometimes destroy the crops. Insects are annoying and destructive. Choice table grapes sometimes sell as high as seven cents per pound in New York and Philadelphia.

Mr. Van Deman, of Washington, D. C., U. S. Pomologist—The Grand Traverse region of Northern Michigan produces fine Delaware grapes. They ripen about the first of October, and bring from ten to twelve and one-half cents per pound. The demand is always greater than the supply. Statistical information shows that the largest per cent. of grape rot in 1887 was in Virginia. New Jersey suffered badly, also. Bagging is an effectual preventive of rot, if applied early enough. The bags must be put on very soon after the fruit is fairly set.

Mr. Smith—Does not the Delaware do best near its northern limit?

Mr. Van Deman—I think so. On the shores of Lake Minnetonka the Delaware is grown to perfection.

Mr. Hatch—I can not understand how the baskets Mr. Hubbard recommends can be packed in the cars so as to withstand the abuse of long shipments.

Mr. Hubbard—The baskets are of such shape as to pack closely by alternating the position—first placing two on the floor of the car, and setting the next two crosswise upon them, and in this way filling up until your car is full. The flaring shape of the baskets leaves ample room for ventilation, while the baskets thoroughly support each other.

Mr. Buck—I fear that baskets would not stand the abuse of the long shipments which we of the Pacific coast must submit to. With the strongest packing we can give our grapes, they are often "pied" before they reach Chicago or St. Louis.

Mr. Stone, of Iowa—Basket-packed grapes reach us in good condition from New York and other eastern states.

President Earle—Baskets are certainly safe for any distance less than a thousand miles.

Mr. Hubbard—The way we pack, baskets are considered perfectly safe, even for the tender-skinned Concord.

Mr. Munson—We ship in baskets with perfect success from Denison to Denver.

Treasurer Evans, of Missouri—The baskets are springy, and exactly subserve the purpose.

Mr. Goodman, of Missouri—There are many portions of Missouri in which the grape succeeds admirably. There is some rot, but they rarely ever need sacking. Our most profitable varieties are Concord, Delaware, Goethe, etc.

President Earle—There will be no regular session of the Society this evening, as we have already accepted an invitation to attend the citrus fair in a body, where the good people of San José have prepared for us a formal reception and welcome to their beautiful city. Before adjourning, I would say that Mr. Pryal has placed in my hands an invitation from the Secretary of the Board of Trade

of Oakland inviting us to visit that city during our sojourn in California.

On motion, the invitation was accepted, with the thanks of the Society.

President Charles H. Allen, of the State Normal School, invited the Society to visit the school to-morrow morning and witness the opening exercises, which was also accepted.

On motion, the Society adjourned to meet at 9 A. M. to-morrow.

THE RECEPTION AT HORTICULTURAL HALL.

The citrus fair referred to by President Earle in his opening remarks this forenoon was formally opened at 7:30 P. M., to which all members of the Society were made welcome.* Here, also, amid this grand display of Pomona's and Flora's choicest offerings, occurred the reception given to the Society by the officials and citizens of San José and the Santa Clara valley. President Cyrus Jones, of the Citrus Fair Association, called the assemblage to order, and, with a few pleasant remarks, introduced His Honor Mayor Breyfogle, of San José, who expressed his great delight, which was mutually shared by all San Joséans, at having secured the meeting of the American Horticultural Society in their midst. He referred briefly to the great importance of the Society and the valuable work it was doing. At the conclusion of his remarks Mayor Breyfogle introduced Judge Myrick, who made

THE WELCOME ADDRESS.

Gentlemen of the American Horticultural Society:

At the request of the citizens of San José and Santa Clara county, I extend to you a cordial welcome. California is made up of people from all parts of the United States, and there is, perhaps, no part of the Union which is not represented here by your members. We are glad to see you here, and there are many among us who will be glad of the opportunity to ask for information concerning their old homes. We are glad you are here because it shows the east is not indifferent to the west, and we can assure you that the west is not indifferent to the east. You have not been asked to come here in aid of any so-called boom, neither do we want you to praise us—it has been said that we are capable of doing a great deal of that for

*For a description of this magnificent display, see Dr. Ridpath's appendix to this volume.

ourselves; but we want you to look around, and from what you see to judge us. We have no distinction to make between this and any other locality of California. While we have not forgotten our old homes, we are pleased to live in California, and after a residence of thirty years I am glad to call it my home.

This city of San José is called the "Garden City." I do not know when or by whom it was thus named, but I might suggest that it was because of its resemblance to the garden of Eden. In one respect it is very much like it. It is this: the first pair was planted in that favored spot, and the first pears in California were planted in this vicinity. The first pair was planted in Paradise some six thousand years ago, and these first pears were planted about seventy-five years ago. I do not know the exact date, but I do know that those who have eaten of these pears have not experienced the trouble of the first pair.

You, gentlemen of the American Horticultural Society, are enlightened on the subject of horticulture, and we hope to reap the benefit of your knowledge, and for that reason we welcome you, also. We have not had the opportunities you have had in the pursuit of your investigations and conferences. What you see of progress in this state has mostly been accomplished in the last ten or fifteen years. We hope to profit by your knowledge, your experience and your investigations. Tell us where we have erred, so that we may profit by your knowledge. We want to know how to do the best thing in the best way, and in that light you are welcome. The people of Santa Clara county welcome you most heartily to their farms, their orchards and their homes, and we trust that the personal friendships thus formed will always be pleasant to all.

RESPONSE BY DR. J. C. RIDPATH, OF INDIANA.

I am unable adequately to express our appreciation of the welcome we are receiving. We will always bear with us the most pleasing recollections of our brief sojourn in San José. It is difficult, in view of rapid transit, for us to appreciate how very far we are from the regions beyond the mountains. Here we are at the very margin that divides the newest of all peoples from the oldest of all, and still we are among friends who speak our own tongue, meeting no unfamiliar accent and no foreign sentiments. Our real interest commenced on entering California at Yuma, where we were so much disappointed that we were tempted to change the engine to the other end of the train and start back again. But we found before going much further that we would have to change the definition of a desert which we had learned at school. We didn't know until then that a desert meant sixty feet deep of soil as rich as that of ancient Egypt. People here have not done their duty in not so instructing us. We supposed a desert was a sort of elevated table-land; but the first desert we struck in California was some three hundred feet below sea level. In my own state we are trying to recover from the waters an area of ground equal to the whole of the Santa

Clara valley. Our fathers had to wrest the state from the woods. In California the great problem is how to get water from downstairs to go upward. We are impressed more than we ever dreamed of being with the vast extent and variety of California in natural features, products, scenery and soil. The great effort and problem of the age is how to secure the greatest results with the smallest expenditure of effort. Nowhere in the world can leisure be reached, honestly, at less expense than in this glorious state. With the settlement of California, there was no longer on the planet a place that could be properly termed "west." The ideal west has gone with the buffalo. Here on this coast man completed the circuit of the earth, commenced thousands of years ago. Would he ever go round again? I do not know; but I do know that no successful movement was ever made in the other direction. The son of Philip of Macedon tried it in reaching from Greece to India; but it rolled back again, being against the movement of the sun. The Crusaders tried it; but the movement turned back upon itself. We have heard that some are afraid the Chinese will come and take this land. Be of good cheer; the Mongolian can never do it. You may take him, but he'll never take you.

The Arabs never pass each other unceremoniously, as we do; when they meet on a desert they stop and salute with many formal salaams. Each Arab carries with him black and white pebbles, and they each, on meeting, exchange reciprocally a black for a white pebble. The black pebble is a symbol and pledge of the perpetual oblivion of each other's faults, the white of the perpetual remembrance of each other's virtues. So we would fain exchange, each and all of us, with you the black and the white pebbles in perpetual remembrance of virtues and perpetual oblivion of faults.

President Earle, in response to calls from the members, arose and made a few remarks, in the course of which he said:

I am glad to respond to the hearty welcome which has been extended to us, and the many courtesies we have received from the day we entered the gates of California. Every American fruit-grower should visit this true Mecca of horticulturists in California. It was to see the wonders of this land that we made this pilgrimage, and we are glad that we are here. The fruit-growers look longingly toward this paradise where all fruits are grown almost entirely without endeavor. When we travel through your vineyards and orchards and see the thousands of tons of fruit that are shipped beyond the Rockies, and when we hear—as Judge Myrick said—that you are only creeping, as it were, in horticulture, who can but ask in amazement, "What are you going to do when you begin to walk?" Do your utmost; the markets of the world are open to you, and there will always be demand for the products of your great industry. We are glad that we came. When we return we will tell of the wonders we have seen, and will send our friends and children here to see the friends who made us so welcome.

The remainder of the evening was spent in viewing the exhibition and in social enjoyment and greetings.

Second Day—Wednesday.

FORENOON SESSION, January 25, 1888.

At 9 o'clock A. M. President Earle called the Society to order.

Elder Runnion, pastor of the Baptist Tabernacle, being called upon, offered an invocation.

[NOTE.—The President's address and the discussions thereon, which, for cause, are published earlier in this volume, occupied a large portion of the forenoon session.—SECRETARY.]

Mr. Ohmer, of Ohio, being called upon, read his paper as follows:

EDUCATIONAL INFLUENCE OF LOCAL HORTICULTURAL SOCIETIES.

BY N. OHMER, OF OHIO.

Mr. President, Ladies and Gentlemen:

I feel somewhat embarrassed to appear before an audience, as this, composed of representative men and women, experts in the arts and sciences of horticulture, and representing all parts of this great nation. However, being a loyal citizen, one that always obeys orders as well as he can, will make the effort to respond to our worthy Secretary Ragan's request to prepare a paper to be read at this meeting on a subject that is no doubt well known to many of you, namely, "The Educational Influence for Good of Local Horticultural Societies." I do not know how to do so better than by giving you the history of the one of which I have been a member from its first organization in 1866, being now in its twenty-second year, namely, the Montgomery County (Ohio) Horticultural Society.

In December, 1866, a half dozen gentlemen met together and talked up the advisability of organizing a horticultural society. They adjourned to meet in January following, when about a dozen gentlemen met and perfected an organization. With the assistance of a friendly press, the object of our organization was pretty well written up in the dailies of our city, Dayton, Ohio, and the result was an attendance of about forty gentlemen at the February meeting. We continued to meet every month of the year in a hall in the city. As long as it was a new thing our meetings were well

attended. The second year the attendance was not so good; the interest began to weaken, and continued to do so until the end of the second year, which came very near being its last. What to do to save us was the all-important question. It was finally suggested that ladies were as much interested in horticulture as gentlemen. Why not change our constitution so as to make the wife a member, as well as the husband, without increased pay? In other words, introduce a social feature by meeting at members' houses, and bring with you not only the wife, but the sons and daughters, also, and a basket well filled for a social dinner. This was done, and the change was marvelously successful, and we have so met every month in the year for the last nineteen years, never having missed one meeting from first to last. All have been attended by from fifty to two hundred members and friends, fully one-half being ladies.

Our meetings in spring, summer and fall are held in the country, or suburbs of the city. These meetings are usually on the lawn, under the shade of trees, dinner being likewise so served; and in winter at members' houses in or near the city. The summer meetings are usually attended by from one hundred and fifty to two hundred, young and old, of as happy people as you ever saw. In the winter the meetings are attended by from fifty to one hundred, usually by the older members of the society. We devote the entire day in getting ready for and attending the meetings. They are an intellectual holiday for us. We usually begin to collect together at ten o'clock. On arrival, the baskets of good things are taken in charge by members of the family. About noon all have come that are expected for dinner. Some come after dinner without baskets.

During the season of fruits, flowers and vegetables members bring to the meetings such as he or she considers worthy of exhibition, altogether making a display far superior to many county fairs. After the proper committees have passed judgment upon them they are usually donated to friends in attendance, or can be taken home.

At first it was considerable trouble to get sufficient quantities of dishes, especially of knives, forks and spoons, for the large number in attendance. Our treasury being in good condition, we, many years ago, purchased sufficient tableware, best Amercan whiteware, and triple-plated knives, forks and spoons, to cover tables and feed all who attend meetings. Parties where meetings are held supply tables, coffee, sugar and cream, and the prepared food to make up an excellent dinner is supplied from baskets brought there. We also have a fifteen-gallon coffee-pot in which to make the coffee. These society dishes are, after being used, cleaned and packed in four large, covered baskets, and the silverware in a tin box under lock and key. All are taken charge of, and are conveyed from and brought to all places of meetings, by a member of the society, and for which he receives a satisfactory compensation.

The lady of the house can, if she wishes to do so, entertain company in the parlor, as the lady members usually take charge of the kitchen, make

coffee, tea, set the tables, placing on them what is brought in baskets, whether it be much or little. The contents of baskets are distributed so that all tables, and all parts of tables, are as evenly supplied as possible. No one is allowed to set the contents of his or her basket before them. In fact, they have nothing more to do with their baskets after delivery. When all is ready, which is usually half-past twelve or one, all take seats, or stand up, as the case may be. Divine blessing is offered up by some one, usually by a minister; then begins the battle of knives and forks. In a reasonable time after dinner the meeting is called to order by the President. The Secretary reads the report of last meeting; then follow reports of special committees on orchards, small fruits, ornithology, entomology, vegetables, botany, meteorology, and ornamental planting. These reports are called for in the order named. Discussion follows each report, which brings out much valuable information, besides enlivening the session exceedingly. Next comes the essay. After being read and discussed we take up miscellaneous business, then adjourn, "to meet at John Smith's first Wednesday of next month."

The report of the meetings taken by our Secretary is published in the Dayton *Journal* the mornings after the meetings, this being our official paper. Other papers send reporters. Our Secretary corrects the proof before it goes to press. After the daily *Journal* has been printed the type is sent to the job-room, is there placed in book form, and 300 copies are printed for us, our Secretary taking charge of each month so printed. After the December report is out all are taken to be bound in pamphlet form for free distribution to all members and friends, thus preserving the reports of our meetings for the entire year at little cost. Our Secretary receives $1.50 for his services each meeting, and we pay the printer $40 per year for printing our reports and a small sum for binding.

Nothing goes into our daily and weekly papers that is more generally read than the reports of our society, thereby doing a vast amount of good to the community at large. We are even aggressive, and at times have attacked our city council for their neglect of duty to the public parks and boulevards of the city, with good effect. We advise how to beautify our public and private grounds, what and how to plant.

In a moral sense our society is doing much good. Most of the members are practical fruit, flower and vegetable growers. We have, however, as members quite a number of professionals—ministers, lawyers, doctors, merchants. *All understand the dinner part of our exercises.* All are on an equality in our society. Any one may become a member by the payment of $1 per year. While this may seem to open the door for objectionable persons becoming members, this is not the case. If perchance one should get in, he will not attend many meetings before he will find out that he is not in his natural element, and will stay away.

Horticultural societies conducted on the social plan, as the one I have been trying to describe, are getting to be common in Ohio and other states. It is no new thing now, but the time was when new societies looked upon

this one as a model to copy from, and when done usually succeeded. These local horticultural societies are auxiliaries to our State Society, and do much to make that society what it is.

I should have told you before now how we secure places to meet the twelve months in the year. Our meetings are not a burden. To show you that they are popular, at the meeting in November last invitations were called for for the year 1888. Twelve invitations were extended, and accepted. The card I hold in my hand gives you the names of the officers, executive, standing and special committees, time and places of meetings, names of essayists, and the order of business.

If societies of the kind I have made the effort to describe were established in all sections of the country, especially where horticultural products are made a specialty, much good would result to all concerned. You would not only learn how to grow the best crops, and how to market the same to the best advantage, but you would also have an opportunity to get acquainted with your neighbors, take part in discussions, and educate the social, the best part of man—and woman, too.

The reading of Mr. Ohmer's paper elicited some pleasant remarks of approval from a number of members, after which the President announced the following committee to memorialize congress on the subject of forestry: Mr. Kinney of California, Dr. Ridpath of Indiana, Mr. Smith of Wisconsin, Mr. Munson of Texas, and Mr. Hubbard of New York.

Major Lauck, of the S. P. Railway—Before adjourning, I wish to say that our company is arranging to give the members of this Society an excursion to Monterey and Santa Cruz. I am about to leave you now for a short trip to San Francisco, where I will receive all necessary instructions from Mr. Goodman, our general passenger agent, and report to you on my return as to all details.*

On motion, the Society adjourned.

Second Day—Wednesday.

AFTERNOON SESSION.

The Society reassembled in the Tabernacle at 2 o'clock P. M., President Earle presiding.

*For full particulars of this interesting trip see Dr. Ridpath's appendix to this book.

President Earle —It seems that the people of this coast are determined to do us honors. Here is an invitation, backed up by the presence of an intelligent committee, to visit the capital city:

To the Officers and Members of the American Horticultural Society:

The undersigned, a committee on behalf of the Board of Trade and citizens of Sacramento, most cordially extend to your honorable body an invitation to visit the capital city of California either as a body or individually, as your convenience may permit, during your stay on this coast, and we pledge you a hearty welcome, and a pleasant, and we trust profitable, visit.

P. E. PLATT,
EDWIN K. ALSIP,
Committee.

The invitation was accepted, with the thanks of the Society.

Dr. Ridpath, of Indiana—In view of the frequency of these invitations, I move that in the future all such communications be referred to Mr. Hatch, as the Society is the guest of the body of which he is chairman.

So ordered.

Mr. Smith, of Wisconsin, was then introduced, who read the following paper:

INTENSIVE CULTIVATION.

BY J. M. SMITH, OF WISCONSIN.

Mr. President, Ladies and Gentlemen:

The above subject is not just the one that I should have chosen had I been given my choice. But you all know that there is no alternative for the private in an army except to obey orders, unless he chooses to desert, and that is generally a harder road to travel than that of strict obedience. Hence, being only a private in this army, I conclude to save my honor and reputation by obeying the order of our President to the best of my ability.

"Intensive cultivation" may be applied either to the farm or garden, though it is oftener applied to the garden than to the farm. It may also be of two kinds: First, of a kind that, while it may be so applied as to produce very large crops, yet, when produced, they will not sell for a sum of money sufficient to pay the expenses of their cultivation, harvesting and marketing.

I have known much of this kind of "intensive cultivation," or farming, done at the east near my native home, a few miles from New York city. A single illustration may not be amiss. Many years ago a wealthy gentleman of New York city purchased a farm near my native home. The land was very poor, but he determined to show those about him that very large crops

could be grown upon it, and commenced improving it at a rapid rate. After he had been upon it a number of years he told me one day about an immense crop of potatoes that he had just stored away. After giving me the entire history of how he had prepared the land, planted, cultivated and harvested them, which, by the way, was one of the largest yields that I had at that time ever heard of, he concluded his narration with the following words: "But they cost me two dollars per bushel for every bushel of them." They were at that time worth from thirty-five to forty cents per bushel in the market.

You will doubtless say that if this is "intensive cultivation" the less we have of it the better for us. Yet, that man was a useful one in the community. He demonstrated to those around him that those poor, worn-out farms could be taken and made to yield bountifully. But he was not a practical farmer. He wanted large crops regardless of cost, and he succeeded in getting them. It remained for those of us who were, or claimed to be, not only good, but practical, cultivators to solve the problem of how to grow such crops at a profit, instead of a loss.

Now comes the question, Can such cultivation be made practical? or, in other words, is first-class cultivation profitable when conducted by energetic, intelligent and practical men?

I have no hesitation in answering this question in the affirmative—whether it be applied upon the farm, in the garden, or upon the immense fruit orchards of California. The same general principles will apply in each case, although the practice must vary in accordance with the wants of the soil, the difference of our climate, the difference in our products. Not only this, but the same products need very different treatment in different portions of our country. For instance, you raise strawberries, and so do we of the far northwest. You are treating us with your berries in midwinter; ours at the same time are quietly sleeping in the frozen earth, buried beneath their covering of snow or ice, or perhaps both. But come to us next June, and, if we have our usual good yield, we will show you acres of them that, in yield, beauty and quality, have never been excelled in the United States. We will feast you upon them as generously, and try to treat you as handsomely, as you have treated us, although the latter will be a very hard thing to do.

In those cases where the yields have been the largest and of the best quality, it has been to a greater or less degree the result of "intensive cultivation;" not of the same character, but of that kind and character demanded by the fruit in different soils, climates and general conditions.

Here again comes the question of degrees. How far may we safely go in incurring expense, and have reason to expect its return with a fair addition to remunerate us for our care, labor, etc.? For instance: If I am preparing land for strawberries, I select a piece that I know to be very rich and what would generally be called in splendid condition. Yet it is rare, indeed, that I spend less than from $40 to $50 per acre in its preparation before a plant is set upon it. I do this with perfect confidence, believing that not

only this but all after expenses will be fully returned, with a handsome sum for me for the use of the land and my care in superintending its cultivation; and it is rare, indeed, that I am mistaken. But suppose I wish to sow the same land with wheat, and incur the same expense in its preparation and after cultivation—what then? Well, if I persisted in repeating the operation, my friends, if I had any, would doubtless consider me a fit candidate for the nearest lunatic asylum, and act accordingly. Still, the same principle applies in both cases, although the practice must be very different.

Hence, we see the necessity of a wide and extensive knowledge of soils, climates, seasons, variety of crops, and their adaptation to and wants in different localities and circumstances. In fact, it seems to me that no other profession in life needs so varied and extensive an education, or such an almost endless amount of good judgment and every-day common sense, as does the cultivation of the soil, provided you expect to be truly successful in your business.

It will hardly be expected, in the short time allowed me upon this occasion, that I should do more than to briefly hint at a very few of the leading principles to be observed by those of us who intend to follow this system of cultivation.

A question of first importance is the soil. It must be good. We have all heard a great deal of talk about the inexhaustible fertility of the soil of the great west and northwest. It is a glorious and magnificent country. I yield to none in my admiration of its soil, climate and general advantages; yet I say to you in sober earnestness that, after seeing millions of acres of, I believe, as good land as the sun shines upon, I never yet saw a forty-acre tract that I considered good enough for me to cultivate for any length of time without artificial fertilization. It is true that these millions of acres will yield fair crops of various kinds for many years; but I am not satisfied with fair crops, and you ought not to be.

Artificial fertilization is by no means all that is needed. There are many millions of acres of first-class lands in our country that are utterly useless for cultivation unless thoroughly drained. There are many millions more, now under cultivation, that can not, by any amount of manure, be made to do one-half of what they are capable of doing until thoroughly underdrained.

One thing more is needed; that is, a most thorough and complete system of cultivation. These are some of the necessities, if any system of "intensive cultivation' is to be followed.

It has been more than hinted to me that, in regard to artificial fertilization, California will prove to be an exception; that her system of irrigation wherever a full supply of water can be had will, with cultivation, prove all that is necessary to enable her cultivators to grow very large crops for an indefinite length of time. I am not quite willing to let this statement go unchallenged.

That wonderful valley of the Nile, called Egypt, is the only spot upon

the earth's surface, so far as I have learned, that is both fertilized and irrigated by nature's hand. For more than five thousand years the river Nile has, year by year, borne within its waters from the mountains of Central Africa a rich sediment that, with the overflow, has fertilized and watered its entire valley of from five to twenty miles wide, and more than one thousand miles in length.

Is this the case here, or is it not rather the fact that most of the water used is clean, pure water? If such is the fact, your growing fruits and grains require something more than is contained in it. Is it not also true that, while your water supplies drink for the thirsty plants, it also brings into solution such supplies of plant food already within your soil as enable it to give you at present the bountiful yield of fruit of which we read and hear? If this is so, and it seems to me that there is no doubt about it, are you not drawing upon the great bank that nature's God has stored away for future generations as well as for yourselves? Can you continue this course indefinitely and still live? Can you continue year after year to take a part from the whole, and still have the whole remain? In short, if these points are well taken, will not your system of "intensive cultivation," as now carried on, result in the final destruction of your lands? I ask these questions in no spirit of complaint or fault-finding. If I am wrong, I shall surely be glad to be set right. If I am right, it seems to me that these questions should receive serious consideration before it is too late to remedy the evil except at a fearful cost.

A few words more, and I will close. It is probably evident to the audience that such a system as I have briefly outlined can not be made to pay expenses the first year, unless it is in exceptional cases. I believe that I own no land that did not run me in debt the first season that I cultivated it; yet it was fairly good, even for our rich western soil. The second year we always hope to make it at least pay all of its expenses, and the third year to make some money for us. After this it is expected to improve gradually in the quantity and quality of its crops, until very large ones are the general rule, instead of the rare exception.

I have followed the intensive system of tillage according to the best light that I could obtain. To this has been added my own experience and close observation for many years. One thing is certain: if I had purchased the land that I now own at the time that I did, and at the price I did, and then followed a slipshod, hit or miss method of tillage, we could never have paid for the land, and should have been driven off from it long before this, or else have remained upon it entirely at the mercy of our creditors; and to-day wife and myself would have been asking ourselves and each other how we should get through the winter, and what ways and means we would devise to keep up our courage for another year, and at the same time persuade our creditors that we should at some time pay them their just dues. But by following the opposite system our land, though high-priced, has furnished money to pay for itself, interest and principal. It has furnished money to

pay for an expensive system of improvements. It has furnished a large family with a nice living, and for a number of years past with a fair amount of spending money. It enables us to go, at the bidding of our President, either to New Orleans, Ohio or California to attend the conventions of the American Horticultural Society. If he and our good Secretary Ragan should decide to hold the next convention in Central Asia, I do not know but it would furnish means for us to go there. At all events, it promises to do much better in the future than it ever has done in the past.

Gentlemen, I know of no reason why this system should not do as well for you as it has done for wife and myself. I make no claim whatever to having put my land to its best. I have simply done the best I knew, with the light and knowledge that I was able to obtain. I hope to do much better in the future than I have been able to do in the past.

There is, in my opinion, no doubt but that we are upon the eve of a much more rapid development in agricultural improvement than has ever been known in the past; and it will be only those who keep themselves in the front rank of this onward march that will reap its full benefits. Then, let us be sure that we are not left behind in this forward march, but be ever upon the watch for a step still in advance. We shall thus advance not only our own interests and the interests of those around and dependent upon us, but also the well-being of the entire community, as far as our influence or interests extend.

DISCUSSION ON MR. SMITH'S PAPER.

Dr. Ridpath, of Indiana—I can not agree with Mr. Smith that the valley of the Nile has received all its fertility from its sedimentary deposits. The valley has only been raised four feet during many centuries of its history, and this mainly by drifting sands from the Libyan desert. It receives its great fertility from the fecundating waters during its periodical overflows.

Dr. Kimball, of California—In California almost any kind of desert can be converted into a garden simply by the application of water. A sand plain may be thus converted into a fertile valley by the use of the snow-water from the natural reservoirs in the Sierras. In Inyo county, near the base of Mt. Whitney, I was surprised to find fine fields of alfalfa growing where naturally only sage-brush grew. Such land, when once reclaimed by the application of water, produces the finest of strawberries and other small fruits. While I have the floor I wish also to speak of the forestry question. After an absence of thirty years I recently returned to my native state, New York. When I left there a tree was almost

regarded as a public enemy. Thirty years ago the Mohawk river was almost a navigable stream; now fears are seriously entertained of its drying up. This is due to the great destruction of the forests. The state authorities have at last begun to realize the danger, and have wisely set apart a large tract in the Adirondacks to be reserved in forests.

Mr. Blowers, of California—Mineral elements in water are essential to its worth. Alfalfa, first supported by the water, brings to the surface, through the absorbing functions of its roots, these beneficial mineral elements, and thus our soils, fairly dealt with, continue to grow more and more fertile.

Mr. Wilcox, of California—The Santa Clara valley soil is almost inexhaustible. In sinking artesian wells in this valley but very little change is noticeable in the quality of the deposits in going to a depth of five hundred feet or more. Five crops of alfalfa may be taken from our soil, annually. Eighty-five bushels of wheat have been harvested from a single acre in this valley. Fruit-growing is now known to be so much more profitable that wheat farming, even with such crops possible, has been in a measure abandoned. I have produced one thousand pounds of onion seed from two acres of ground.

Mr. Wheeler, of California—Scarcely one-tenth of our state is fertilized or irrigated. Orchards and vineyards often require irrigation until they are fairly started, when it may be dispensed with. As for fertilizers, they are so little needed and so little used that I was forced to abandon the traffic in them, which I once followed. Californians do not regard fertilizers as necessary in these rich valleys.

Mr. Munson, of Texas—Nature teaches the best lesson respecting fertilization. The trees flourish for centuries without artificial help. Certain plants flourish without connection with the soil. The great redwood trees have comparatively small roots. An open or porous soil is generally preferable. Water percolates through such soils, leaving its valuable properties to be appropriated by the plant. Water finds its way into tile-drains through openings formed in clay soils. Such soils become porous after having been tile-drained. By the passage of water through the soil in this way, certain alkaline

properties naturally existing become dissolved, and thus afford plant food where only water has been artificially added. Fertilizers are divided into two classes—chemical and mechanical. The fiber and coarse material in barn-yard manures act chiefly in a mechanical way, by rendering the soil porous and permitting the free passage of air and water, both essential to the growth of plants. Your soil in these California valleys can not become compact, owing to the nature of its origin and composition. Prof. J. S. Newman, of the Alabama experiment station, experimented as to the relative effect of fertilizers and of mechanical manures used to render the soil porous, and had found that, while there seemed to be little difference between the effect of one fertilizer and another while the soil was heavy, the plants seemed to "leap up almost double" when it was well drained and otherwise rendered porous, so that the air and water could reach the roots. Both fertilizers and water, when operating beneficially, acted as fluxes, loosening something that the plant life needed.

Prof. Klee, of California—Cereal crops take from the soil large amounts of phosphates. A forest growth, in a state of nature, removes but a small per cent. of plant food from the soil, as by its decay the original elements are mostly returned. Summer fallowing is growing in favor among California farmers. Grain fields, that have been run down by long and constant culture, may be greatly improved by allowing them to lie in fallow a single season. Irrigation alone will not produce a productive soil. The orange-growers of Southern California, who of necessity must irrigate, find it necessary, also, to fertilize their lands.

Prof. Husmann, of California—I hail from the Napa valley, where irrigation is unknown, excepting occasionally for a few summer vegetables. Grain has been grown on the bottom lands twenty-six to twenty-eight years without intermission, and good crops raised with very slovenly culture, half the valley being merely scratched with the harrow and left for "volunteer" crops, which yielded five tons of hay to the acre. When oaks of six feet in diameter were seen growing there, we knew that something below must sustain them. Last year I gathered five crops of grapes, commencing on September 15th and ending the first few days of December.

The yield was five tons to the acre, notwithstanding the loss by spring frosts last season. Either the soil must be inexhaustible, or there were some other elements of fertility, to enable such crops to be raised for so many years without manure. From what I have observed during the seven years I have been in California, I regard irrigation not so much needed as cultivation, the former having often proved detrimental where at first considered essential. as I have experienced in raising grape cuttings.

Dr. Kimball—I only spoke of the wonderful influence of water on barren lands to show how inexhaustible our soils are. I know lands in Alameda county that have borne crops of barley and wheat for more than a half century without receiving any fertilizers other than water from our mountain streams.

Mr. Smith—I am well satisfied that fertilizers would be of benefit, even in California. If I did not use them liberally I am sure wife and I would not now be with you to enjoy these meetings.

Dr. Ridpath, being called upon, read the paper of Mr. P. M. Augur, of Connecticut:

THE EXPANSION OF SMALL-FRUIT CULTURE AND ITS EFFECTS.

BY P. M. AUGUR, OF CONNECTICUT.

This subject is one of special interest to all admirers of the good and beautiful, and to those who favor healthful luxuries in the household; and yet we are confronted with an idea at the outset, to wit: the danger of an excess of a perishable commodity in overcrowded markets. Therefore, to recommend an indiscriminate rushing of every land-owner into small-fruit growing would be impolitic and unwise.

This business truly needs wise foresight and thoughtful precaution. A surplus of grain means delay in profitable returns; a surplus of small fruits means *loss* instead of *delay*. Here the law of demand and supply should be rigorously heeded and its lessons carefully followed, and here again the law of "the survival of the fittest" must appear. Thus, every year thousands abandon small fruit culture as unprofitable, while other thousands embark in it as an experiment, many, of course, to be disappointed.

That ten times greater supply of delicious strawberries and other perishable small fruits could be judiciously used we all admit. Many a man smokes his half dozen or more cigars daily as a matter of course who never feels that he can afford a good dish of strawberries for his family at home;

and many another spends his money freely for *beer* or *whisky* for himself, but nothing to luxuriate his wife and little ones at the home table. Hence, what might be, in expanded small-fruit growing, is not, and can not be, under present environments without low prices, or, worse, a broken market. But with these obvious limitations the question still recurs to us, must we stand still or advance? We believe, in spite of all the set-backs, that society is improving. We believe that our people are growing wiser and better on the whole. We believe when business is less hampered by unnecessary extortions in all forms; when the real necessaries of life and necessary articles of manufacture are offered at moderate rates, so that a man's wages shall be adequate to fully provide for not only the bare necessities but for many of the comforts of life—when this time comes we may reasonably look for a largely increased demand for our small fruits.

Another idea will be applicable in this connection. Last summer, when we were wholesaling large strawberries at from twenty-five cents down to twelve cents per quart, another grade was brought into market selling from twelve down to five cents per quart, and four quarts for a quarter at retail. Now, while we were getting double price per quart, we were also getting double the number of quarts per acre. So at every point we had the advantage in profit; and in case of an absolute glut, it is always the case that the trash goes to the waste. As Daniel Webster said in reference to the law as a profession, "there is room *higher up*," so say we in regard to small fruits.

Premising as above, we aver that in expanding small-fruit culture we should expand first of all in better culture, better varieties, higher fertilization and largely increased yield of large, beautiful berries. We greatly need improved methods. And here, leaving generalization, let us come down to detail.

Taking the strawberry, let me say that we not only need the best varieties but the best plants. Eggs are sold by the dozen. Strawberry plants are also sold by count, and to many a man 1,000 plants means 1,000 plants and nothing more, howsoever or by whomsoever they are produced; whereas, they may vary in vigor and actual capacity as from 10 to 1.

First—Our unvarying method is to be specially careful in selecting stock plants. (This is also applicable all through the vegetable kingdom.)

Second—Never propagate from a plant that suffered from fruit exhaustion; a plant that has given, as some of ours have, over two quarts of fruit may still live, but is not fit to be a parent plant. *Remember this.*

Therefore, when we read of deteriorating of varieties we can say *yes* or we can say *no*, as it depends so much upon management. I know of farmers who have cultivated the same variety of Indian corn for more than twenty years with a constant improvement, so that it has been a continual gain from then till now. The same may be true of the strawberry; and any quality of plant or fruit may be intensified by judicious selection and cultivation. In the same way we may often remedy defects, to wit: Suppose a variety like the Jewell propagates slowly, and the requisition is to secure more rapid in-

crease; then choose for parent plants those which throw out runners most freely, and in due time this productive variety will satisfy in reproduction of plants. To a grower of fruit the above peculiarity is hardly a defect. A plant with a strong root system, which multiplies crowns rather than runners, has a strong desideratum, and is most likely to reach the maximum in fruit production.

Our cardinal principle, then, is this: *Pre-fruiting* plants are invariably to furnish our stock for the propagating beds. This, of coarse, implies the cutting off of all blossoms as soon as they appear, on all our propagating beds. Another point is to secure one crop only from the same plants and the same land at one setting. An extra fine crop is more desirable than two or three inferior crops. And now comes the point, how to secure the maximum crop. This opens a subject as broad as the divergent views of culture in the world of horticulture.

From what has been already said it will be supposed that we start with a good variety and a good stock of plants; this is the *sine qua non.* This lies at the foundation of success. Again, the variety, no matter how desirable, must be adapted to our soil. Some varieties that do remarkably on a rather heavy soil may absolutely fail on sand, or on a pure peat soil (and possibly *vice versa*), though we always favor a strong soil for the strawberry. Our ideal of the strawberry acre would be a strong loam with a retentive sub-soil, thorough underdrainage, two or three previous years' clean culture with some hoed crop each year, and heavy annual dressings of grain-fed horse-manure, including the autumn previous to setting; in early spring, as soon as the land is in condition, use plow and pulverizing harrow and mark both ways for planting. For spring planting we advise three feet by one and one-half feet. This will require about 9,680 plants per acre. If the principal kind is a pistillate, like the Jewell or Jersey Queen, we advise planting every fourth row of two good bi-sexuals, say Charles Downing and Sharpless, or Sharpless and Cumberland; thus, first, fifth, ninth, thirteenth, and so on; the intermediate rows to be the best pistillate variety for the locality and soil. Now, using the bi-sexuals, for instance Sharpless, commence on first and plant on every alternate mark; so on the fifth, ninth, thirteenth, and on to the end of the piece. Then commence with Cumberland, Jessie, or whatever bi-sexual you choose next, and, going over the same rows, plant on the omitted alternate marks through the piece.

Now you have given every flower on your piece an elective choice between the pollen of two somewhat diverse bi-sexuals. By so doing you have furnished the most perfect conditions for complete development of every flower on the field.

Our experience and observation go to show that these ideas are not mere vagaries, but that in them lie the highest conditions of success, both in quantity and quality, size and beauty of fruit. Having the ideal acre set with plants of exceptional vigor and in manner as already indicated, let the culture be thorough and frequent; allow each plant to make only two ad-

ditional plants—X $\begin{matrix} S \\ S \end{matrix}$ X $\begin{matrix} S \\ S \end{matrix}$ X $\begin{matrix} S \\ S \end{matrix}$—X representing the stock plants and S the newly-formed plants. Thus restricted, the triple row of plants will be of unusual vigor and enormous size, with wonderful fruiting capacity. Let it be remembered that during this year of growth the blossoms are to be invariably cut on their appearance, that we are laying the foundation for great things to come.

The question may be asked, How will you prevent the work of the white grub and other destroyers? We reply that after two years of clean culture, with care to destroy all marauders, there will be little damage from grubs or other enemies. But as a precaution allow some plants to make extra runners to fill occasional vacancies.

When winter sets in, mulch judiciously with evergreen boughs, sowed corn or coarse hay, or even strawy horse-manure, being careful, while doing it well, not to overdo. The great object of the mulch, be it remembered, is not to prevent freezing, but to prevent alternate freezing and thawing; therefore, the most perfect winter condition is one where the plants are perfectly dormant.

When spring opens, be patient until all danger of ground freezing has passed and the soil has sufficient warmth to start vegetation. When this time has come, carefully remove all coarse material from the plants and give a complete shallow hoeing and weeding, leaving the ground still uncovered to get fully warmed up. The plants will now show wonderful vigor and a profusion of bloom that will be delightful to behold. Your brightest day-dreams will promise a full realization.

Now, let well enough alone, and keep off your patch until the berries begin to show white a little, when re-mulch with clean material just sufficient to keep the fruit clean. Coarsely cut straw or lawn clippings are excellent, but let the operation be done by careful hands; and thenceforward let no careless feet or rude hands go among those plants. Visitors will come around, but let their curiosity be satisfied and their exclamations go forth from the border of your piece, not from the interior.

Ripening commences (and here let me say that the same field with thorough underdrainage will ripen from four days to a week in advance of the same not drained; that is our experience). If you have fancy berries, as you probably will, allow only *expert* pickers to gather them. Send to appreciative dealers in attractive packages, and you may usually dictate prices with confidence. We have come to feel that a choice crop had better be handled by only experts at so much per hour, rather than be picked per quart by average pickers.

In regard to the amount of yield, we simply say that a possible yield is far more than most people will be willing to admit. On a *field day*, on our own ground, many persons remarked that if they had not seen they would not have believed what they saw in size and yield.

We have spoken of spring planting and the formation of triple rows. We have had nearly or quite as satisfactory crops by planting out in July strong primary young plants in ground strongly enriched on which early peas or some similar crop has been grown, the ground cleared, plowed and subsoiled, finely raked down, and planted in rows two feet by one and one-half feet, after which faultless culture was given, and runners all clipped off. A record shows that the number of picked quarts exceeded the number of plants. This was on a patch which, as measured by Dr. F. M. Hexamer and others, contained just one-twenty-second of an acre, the total yield of which was 678 quarts, or at the rate of about 466 bushels per acre. Mr. J. S. Woodward, Secretary of the New York State Agricultural Society, saw a quart of ripe berries picked from a single plant at one time, leaving forty-eight green berries on the same plant, nearly all of which afterward matured. We would not feel at all sure that even this may not be exceeded. The variety from which this yield was obtained was the Jewell, and the size and beauty of the berries, as an average, were as remarkable as the yield. Our heaviest yields have been on a rather heavy soil, with at least two years' previous high culture, with tile-drains 40 ft. apart, 3 ft. 6 in. deep, the soil mellowed with a subsoil plow 18 inches deep; and we regard the above preparation as a valuable safeguard against drought and as a most important auxiliary in thoroughly aerating the soil. Of the single plant rows, two feet apart, in very many places the plants touched between the rows, making a spread of full 24 inches to the best plants.

Our plan, then, for the expansion of small-fruit culture would be to intensify, rather than overspread large areas. Parties living, as some do, near cities, where excellent manure may be had for the hauling, can easily expand in the fullest sense; but where horse-manure costs $5 or $6 per cord, besides the cartage, it changes the whole aspect of affairs. Those who depend largely on concentrated commercial fertilizers should use extreme caution, as there is a limit to judicious and safe application. While we use special strawberry manures, we use to supplement, not to supersede, stable manures. The mechanical effect of stable manures upon the soil is excellent in giving good tilth and porosity to the soil, thereby enabling better results to be obtained than by the same elements in a more compact and concentrated form. Again, a strongly concentrated manure sometimes has a caustic effect, especially if applied in excess.

In conclusion, allow me to say that, in view of the present outlook, we advise beginners to use great caution in their operations. A crop such as we have spoken of is, as you may well believe, exceptional. The previous preparation overlooks two or three years of liberal expenditure in time, capital and skilled labor. A most judicious and generous expenditure is indispensable. Hence, let beginners commence on a limited area; and in any case do not greatly overstock the market. The small-fruit business, like any other business. may be overdone. The public press can and should do much to create a fuller and more general use of small fruits. The sani-

tary effect of a wider use of fruits would be most salutary. But such increase will be only gradual, and also depends in no small degree upon general business prosperity throughout the country. Therefore, we caution a good outlook before embarking in the work, judicious management all through, and a high aim in good culture, remembering that a superior crop nets the profit, while an inferior crop involves the disappointment and loss.

We would not be so selfish as to make corners and hold extravagant rates; rather let there be an abundant supply at moderate, but at paying, rates. With thorough culture and successful crops, we may adopt the motto, "*Post prelia, premia*"—"After the battle, the reward."

President Earle, of Illinois—We have another paper which I think I will now call up, as it and this one by Mr. Augur may then be discussed together:

DEWBERRY CULTURE.

BY I. N. STONE, OF IOWA.

While there is hardly a state which has not some variety of dewberry growing within its borders, still it has not until recently found a place in the fruit garden, and we predict that it is soon to occupy a very important place in the list of small fruits throughout the United States. The dewberry is of the blackberry family, and is often called a trailing blackberry, Some varieties are propagated from tips, the same as black raspberries; others by suckers naturally, but may be propagated from tips, also. The tip varieties are the best for general cultivation, as they may be kept within bounds as easily as the black-cap raspberry.

The dewberry has a more sprightly flavor than the blackberry, is larger, ripens earlier, and, having a glossy black color, does not turn red after picking, and is considered by many to be far superior to the blackberry, either fresh from the vine or when canned. Its large size and attractive appearance, and its ripening in advance of the blackberry crop, insure for it a good price at all times, even when the market is overstocked with other berries.

The trailing habit of the dewberry canes renders them as easily covered in a cold climate where winter protection is needed as a strawberry bed, requiring about the same amount of mulch.

There is no kind of small fruit that will stand drought as well as the dewberry, except, perhaps, the grape; in fact, its roots will run down about as deep; and while it succeeds well on a loose sandy or gravelly soil, it will also produce well on a heavy soil if not too wet.

They should be transplanted in early spring, setting tips only. Do not use suckers at any price. Plant three and one-half by six feet, and cultivate shallow one way only, with a horse, using a hoe between the plants in the row. The first year we can cultivate close to the row, regardless of the

canes, as the cultivator will turn them without injury so they will grow alongside of the row. After the first year the canes should be pinched or cut back to about two feet when two and one-half or three feet in length. It will be necessary to go over the vines several times during the growing season in order to prune the earlier and later canes at the proper length.

All varieties need winter protection, in a cold climate, to insure a good crop every year. Just before the ground freezes the canes should be placed along the rows, then covered an inch or two deep with mellow soil, and before severe winter weather sets in cover the whole surface with mulching, using more over the rows than between them. In the spring work the canes up through the mulching with a fork, and move the mulch from between the rows, placing it along the row and under the canes, leaving the plantation so it can be cultivated one way only.

The canes may be tied to a trellis, or racked by driving stakes on each side of the row, so they will be about two feet high; then attach a wire to the stakes on each side of the row, so they will be at the proper height to allow the canes to rest upon them; if the wires are placed at the right height the canes will not need tying. It will pay to use mulching under the bushes even where it is not necessary for winter protection, as it will keep the fruit clean and render the soil fertile and moist.

Much might be written about the different varieties of dewberries which are being introduced, but I will only say that I have succeeded well with the Bartle's Mammoth and Lucretia. Both are tip varieties, productive, and their fruit is excellent.

DISCUSSION ON SMALL FRUITS.

Mr. Smith, of Wisconsin—Mr. Stone, how will the yield of dewberries compare with that of blackberries?

Mr. Stone, of Iowa—About the same. Under favorable conditions the dewberry may yield 100 bushels to the acre. The dewberry bears shipment well. I think the Bartle's superior to the Lucretia. The season of ripening of the dewberry is about three weeks. In California I understand that the dewberry is longer in season than the blackberry. All things considered, however, I consider the blackberry the more valuable fruit.

Mr. Paulsen, of Oregon—In our state we have wild dewberries, which sell for better prices in the markets than blackberries.

Mr. Stone—The dewberry outsells the blackberry in all our city markets. The berries are preferred on account of their better quality.

Mr. Wilcox, of California—Dewberries have not succeeded in California. Strawberries pay me better than any of the small fruits. They will yield a paying return within twelve months after planting. I have realized as high as $650 per acre from strawberries. They average me something over $100 per acre.

Mr. Agnew, of California—I have sold from nearly two acres of strawberries $1,300 worth of fruit. The yield was 200 chests of about eighty pounds each.

President Earle—That would be equal to about 5,000 quarts per acre, which is much less than some of our eastern growers produce.

Mr. Gish, of California—My crop of the Longworth, which was the seventh crop from planting, produced 57½ cases per acre.

Mr. Ohmer, of Ohio—I have produced as high as 175 bushels of strawberries per acre. From four acres of Kittytinna blackberries I produced 562 bushels of fruit.

H. E. Van Deman, U. S. Pomologist, read the following paper:

DIOSPYROS KAKI IN NORTH AMERICA.

BY PROF. H. E. VAN DEMAN, WASHINGTON, D. C.

So far as I have learned, the first trees of the Japanese persimmon (*Diospyros Kaki*) grown in North America were from seeds obtained and sent by Commodore Perry, of the United States navy, to Lieutenant Maury, in 1856, and were planted at the Naval Observatory at Washington. The first fruit was produced on these trees in 1860. None of these seedlings or any of their progeny, so far as known, were distributed, and the old trees are now dead.

The next introduction of this species was by a lot of seeds imported from Japan by Mr. Wm. Saunders, of the United States Department of Agriculture, in 1863. They were planted on the grounds of the department, and germinated freely, and a part of the seedlings were sent out for trial. Some of the original trees grew to bearing size, and in at least one case produced about a bushel of fruit on a single tree, but all the older trees on the grounds of the department are dead. Owing to the crude state of pomology in Japan it was almost impossible to get grafted trees until about the year 1870, when the Department of Agriculture imported a lot of grafted trees of named varieties. These were distributed all over the United States, but principally in California and the gulf states. The nomenclature of these varieties was very imperfect, many trees being without name, some with

dual names, and different varieties with the same name, as subsequent experience has proved. At the present time (1888) great difficulty is experienced in identifying the different varieties of this fruit.

A great many of the trees sent out (which included many of the first seedlings grown by Mr. Saunders) died from being planted in too cold and unfavorable situations, and some of them that were planted where they ought to have done well were very much neglected, and having done poorly created little interest. But some of them, under more favorable circumstances of both climate and culture, produced excellent results, and the nurserymen of the country began to import and sell trees. Mr. S. B. Parsons, of Flushing, L. I., Mr. P. J. Berckmans, Augusta, Ga., and Mr. H. H. Berger of San Francisco, Cal., were among the most prominent of those engaged in this work. H. H. Berger & Co. are now extensively engaged in this business and have a branch nursery in Japan, where the trees are being propagated for sale in this country.

After repeated trials all over the United States and in Canada, it is now known that the species will not safely withstand a climate where the temperature falls to zero even occasionally, and some varieties are even more tender. There is considerable difference in the varieties as to hardiness. The northern limit of successful growth is about like that of the fig, being on a line with Charleston, S. C., Southern Tennessee and Northern Texas, but extending several degrees further north along the Atlantic and Pacific coasts. Georgia, Florida, the gulf states and California seem well adapted to its culture, and by experienced travelers in Japan it is said to do better here than there, the fruit being larger, fairer-looking and of better quality. The tree is a more luxuriant grower than our native species, *D. Virginiana*, and makes a handsome tree, with large, glossy leaves

The flowers are sometimes perfect and sometimes imperfect, because the stamens are abortive. The perfect flowers are always found in the axils of the leaves and always solitary. The imperfect flowers are sometimes found in clusters. The species may be said to be diœciously polygamous.

The fruit is, in size, from one and a half to three and a half inches in diameter, and an occasional specimen has been known to weigh twenty ounces. In shape it varies from flat to round and oblong-conic. In color it is from chrome yellow to bright red orange, the latter being the most common. In flavor it is very sweet, and the pulp is very soft. There is, however, considerable variation in both these respects. Some of the varieties require frost to make them at all palatable, or before their natural acridity will leave them. Others are never acrid or astringent in any stage of their growth. Many kinds are seedless, and none have more than a few seeds.

As a fruit it is steadily winning its way into the markets of our larger cities and may be occasionally found on the fruit-stands of the eastern cities. Up to this date there has been but little of the fruit to sell. The largest amount grown by any one person or firm, of which I have heard, was by Mr. J. Crawshaw & Son, of Lawtey, Fla. I have been informed that the past

year they sold over one hundred bushels, principally in New York city, at an average price of about $7 per bushel. The fruit ships remarkably well, as it should be picked a little before it is ripe, and can then be transported with perfect safety for thousands of miles. It matures and softens very gradually, and makes an excellent fruit to handle by venders at the fruit-stands. It has an additional advantage in being very attractive in appearance.

The fruit-growers in the sections in which the tree succeeds are beginning to realize its importance, and one firm in Florida of which I know will this winter plant over three thousand trees in addition to those already set. If it continues to grow in favor it will soon be as commonly grown in the southern states and California as any other fruit.

DISCUSSION ON MR. VAN DEMAN'S PAPER.

Secretary Ragan, of Indiana—I do not care to speak of the merits of this interesting paper, nor of the topics treated by the writer, for they are of little interest to the people of our latitude, but rather of the official position held by the writer. The office of U. S. Pomologist is the creation of the present Commissioner of Agriculture. The pomological interests of the country should be greatly promoted through the instrumentality of this new bureau. Fruit growers everywhere should avail themselves of the valuable services of the chief of the department. There are very many ways in which an efficient officer at the head of such a department of the government may render himself useful to the cause of pomology. He enjoys the frank of the Post-office Department, and through this medium any citizen may transmit to him specimens of fruits, etc., from any section of the county, for identification or correction of nomenclature.

Mr. Van Deman, Washington, D. C.—In regard to the collection of specimens for purposes named by Mr. Ragan, I have had prepared mailing boxes, of various sizes, which I will gladly send out to persons wishing to use them in sending specimens to my office.

Mr. Buck, of California—The Japan persimmon thrives almost anywhere in California. We grow a number of varieties. It is a showy, handsome fruit, but we do not find it valuable. I know of but few persons who really like it. I have propagated it on the native Virginia persimmon, but even then it is not of good quality.

Mr. Wilcox, of California—The Japan persimmon was first introduced into California by a distinguished missionary. It is not a desirable fruit here. California nurserymen have about quit growing it. Most of the trees now being planted are imported from Japan. The fruit must be very ripe in order to be palatable.

Mr. Masters, of Nebraska—The Japan species does best when top-grafted on our native persimmon.

Mr. Van Deman—I do not believe that top-grafting improves the persimmon in the least. Mr. Buck is right when he says a taste must be cultivated for this fruit. Persimmons grown in the gulf states are larger than those grown in California.

Mr. Klee, of California—This fruit is best when grown near the coast. I have had specimens sent me, grown in this state, that weighed a pound. California-grown trees took the premium at New Orleans.

Mr. Coates, of California —I do not think the Japan persimmon has received the care in culture on this coast that it deserves. I have known them to sell in the San Francisco markets at $2 per box of twenty pounds. I have seen some very delicate preserves made from this fruit.

Mr. Van Deman—The persimmon is the apple of Japan, holding there a first rank as a valuable fruit. They are used in various ways—in the fresh state, dried, pickled, preserved, and made into marmalade.

Mr. Lindley, of North Carolina—In our state the native persimmon is almost a staple crop. The Japan species grows much larger than the native and is finer in quality. I think it will prove to be valuable in portions of North Carolina.

President Earle—The Japan persimmon does well all along the gulf coast, and is growing in favor with the people.

On motion, the Society adjourned until 7:30 o'clock P. M.

Second Day—Wednesday.

EVENING SESSION.

The Society reassembled at 7:30 P. M., President Earle in the chair.

Vice-President Munson was introduced, and read his paper:

WILL THE FUTURE MAN EAT PEACHES?

BY T. V. MUNSON, OF TEXAS.

MR. PRESIDENT: In this you gave me a hard nut to crack; but not to be outdone, I shall try it, if I break all my teeth (facts) in the attempt. To start with, I should remark, "That depends:"

First, whether or not the taste of the future man continues, as now, to regard a ripe, buttery, juicy, perfect peach as delicious and healthful.

Second, whether or not it will be possible to continue to grow peaches.

At first thought it would seem that we should answer, without hesitating, each horn of the dilemma in the affirmative. Certainly, we always would the first though we are aware of the fickleness of human taste, and how we have ceased to practice the custom of our progenitors of eating the delicious flesh of our human captives, and how devotedly the young ladies take to chewing paste and wax, and the young men tobacco and licorice, in preference to plain bread. Maybe some inventive genius, taking the hint from butterine, will find a substitute and name it peacharine. We have already tried nectarines, but they just won't do—in Texas.

However, as we begin to cast up the innumerable vicissitudes of peach culture, we at least admit that the second proposition is worthy of a few moments of serious consideration.

That we may more clearly comprehend the situation and its future probabilities, let us name a category of the chief and constant drawbacks which environ the grower of this queen of fruits, and then rummage our lists of preventives, cures and palliatives, and try to draw an approximate answer at least sufficient to say whether or not we and our children can reasonably plant more peach trees.

Let's see; there are the borer, liability to be killed by cold, the curculio the rot, the yellows, the leaf-curl, the root-rot of several kinds, the difficulty of marketing, short life of the peach tree, etc.

We shall at once fall upon this den of thieves and robbers against our honest toil. The life of the successful fruit-grower is a relentless warfare. The battle is never ceasing. But remember, "a battle well planned is half won." The planning here, as in all warfare, chiefly depends on our knowledge of the exact nature and whereabouts of the enemy.

BORERS.

We charge first on the borer—that wasp-like fly, with its orange abdominal belt ever on. Like all true flies, it has no sting and only two wings. It would have four wings if of the wasp family. As a chrysalis beneath the large roots of the tree it hibernates, after having voraciously eaten the bark to the wood, perhaps girdled your tree just below the surface of the soil, showing its presence by gum and brown powder intermingled. In the spring, about apple-blooming time, it emerges from the pupa-case as a fully grown fly, to seek a partner and peach trees anew, and about their collars lay eggs, then skulk and die, leaving the litter to hatch into young borers, on the outside of the bark. As soon as hatched—early in the fall—they silently gnaw, and soon imbed themselves in the live, tender bark, leaving the harder outside part as a protection, and stop their entry with gum to keep out water.

Remedy: Clear away the soil down to the first roots in August or early September; scrape and brush the collar clean, to the roots, with a sharp knife; take out all borers that may have entered; then with a coarse brush paint evenly, but lightly, with hot coal-tar, the exposed roots, collar and body to eight or ten inches above ground. Level back the soil, and no borer will again bite that tree for at least three years. Nor will harm follow the moderate use of tar, as directed. This the writer has seen fully demonstrated on a goodly number of trees, which have grown vigorously for two years since, where an excess of hot coal-tar was used. I never wish to see trees in better condition. This test was made by Dr. A. M. Ragland, of Pilot Point, Texas. To him, I believe, belongs the credit of this simple, effectual and harmless remedy. The tar never washes off, and I believe one treatment, when the tree is two years old, a sufficient preventive for three or four years.

Other remedies for the borer there are many—even "patent tree-jackets." The old method of mounding up every spring and leveling down and cleaning bodies in fall is the next remedy. Be careful in using coal-tar on apple or other trees having thin bark.

For a remedy for late frosts, hard winters, etc., nothing is absolutely certain, except to go to a country where frost never comes, and plant Peen-to and Chinese honey, and a few other semi-tropical varieties. Otherwise, plant upon the bluffs on the south or southeast side of a lake or large river. Third, plant varieties known to be hardy in bud and bloom, which often bear well when others entirely fail. A few of such are most of the Chinese cling seedlings (though Chinese cling itself is shy). Such are General Lee, Family Favorite, Mamie Ross, Sylphide, Thurber. Nearly all the Hale's Early class, Alexander to begin with, Beatrice, Louise, Rivers, Gross Mignonne, rarely fail. Of the yellow freestones, of the Crawford type, Governor Briggs (originated by Orr Brown, of Oregon), Reeve's Favorite, Wheatland, are more certain than Crawfords. Elberta, a Georgia seedling of Chinese cling, and probably a cross with Crawford, and every way superior to it, is the yellow

freestone, in both tree and fruit *par excellence.* Even in New York it is reported as enduring the winters well when Crawford is killed to the snow. Picquet's Late, a cross between Crawford and Columbia, and Scruggs, of Texas, with similar parentage, are very sure and excellent. The fact that such excellent varieties as these crosses between widely different strains stand at the head of the list of fine and sure peaches is a valuable pointer to the experimenter.

The Oldmixon Free, Druid Hill, Mrs. Brett, Ringgold, Bonanza and (far south) Onderdonk will not often disappoint. Of very late peaches, Crimson Beauty, Henrietta, Lonoke, Bonanza, Yellow Cobbler, are fine and sure, but where Heath is the last peach to ripen are useless. They do well in all the southern states.

CHEAP SMOKE.

Smudges, where plenty of smoke can be made cheaply, and the man is vigilant enough to stay up all night and watch his thermometer, make his smudges in the right place, *sometimes* save a fine crop, and *then* that man is happy, his neighbors disconsolate, and he declares that smudges return a large percentage on the investment; yet there is much lottery in smudges and smoke after all, especially the smoke of a man who saved his crop with a few smudges when something else did it.

For the Little Turk, I have nothing new. Eternal vigilance with the sheet, funnel, mallet and coal-oil grave will secure much smooth, sound fruit as against neglect.

The rot—that terror of the early peach, nearly always and almost every variety in the southern states in a wet season—I must acknowledge still holds the situation. High location and thorough drainage avoid it to some extent. I only dare suggest thorough spraying of the trees while the fruit is yet young, and before the rot germ has penetrated, with a mixture in solution of the sulphate of copper and lime—the Bordeaux mixture, so successful in combating mildew in the grape. This, also, might be offensive to the curculio, as in the grape it is to the insects which prey upon the leaves, and thus rid us of two evils at once. Experiments are much needed here.

Ah! I see the most terrible ghost of all now coming—"The Yellows." This scourge seems to permanently curse the very earth in which it once devastates an orchard. It is a well-known fact that the regions in Delaware, New Jersey and Michigan once famous for peaches produce peaches no more. The "peach belt" has moved back time after time, with every set of new orchards, to fresh lands. Good culture, vigorous varieties, potash manures, resting the land for a series of years where trees once have grown, may again induce the peach to be grown with some success. Yet there are localities, or soils, or climates, which the yellows seems never to invade. Such places are the table-lands on mountain spurs in East Tennessee and other places in the south and in California. Yet it may be the disease is only waiting its opportunity to blast these fair gardens. Let us hope for

the best, and study more carefully the nature of this most insidious enemy. It will be a long while, however, before man quits eating peaches if he waits on the yellows alone to cut off his supply. The ingenious and observing will manage somehow to grow a few peaches even in the yellows' region.

The leaf-curl is rather too trifling for serious hinderance. Some varieties resist much better than others.

"Root-rot" is more commonly the result of poor drainage than a true disease. The feeding root fibers, by being submerged too long in wet weather, are drowned; then various scavenger fungi devour the dead roots, and the tree, supported only by a few surface roots, at last tumbles over. There are, however, true diseases, microscopic organisms, which, in some regions near the gulf, attack healthy roots of the peach, mulberry, fig, willow, cow peas, grape, tomato, cucumber, etc. This is more often called the "root knot," and is traced directly to a minute worm of the genus Anquilula. In some places in Florida it is quite destructive to the fig, mulberry and peach. It causes bead-like knots to at first develop on the small roots; afterward decay sets in, and the plant or tree dies. No remedy is known.

It is also claimed that excess of alkali in the soil causes root rot. Such disease shows itself in excessively limy soils in the sickly yellowing of the leaves after long periods of wet weather. This by the French is termed chlorosis when in the grape. It simply means yellows, but it is altogether a different disease from peach yellows, which seems worse in poor, sandy soils, devoid of lime.

DIFFICULTY IN MARKETING.

The difficulty of marketing the peach is remedied only by the pushing, industrious man, possessed of shrewd business tact. It is a fact that horticulture nowhere has a place for the sluggard, unless he be a tramp in the back row of the orchard or melon patch. Even then the shotgun and watch-dog appear in his dreams, and sometimes when he is awake.

The commercial evaporator and cannery are the markets' great safety-valves. Especially is this the case with this otherwise perishable fruit. With these and all the aids of scientific investigation in discovering causes and preventives of failure, as well as means of success, we would predict that, not only future, but universal man will come to eat less meat, less tobacco, and more peaches. He will find it better, too, to drink less coffee and whisky, and more water, cider and wine.

The large planter of peaches ever inquires after four classes, namely: the best producers, the best shippers, the best canners and the best evaporaters.

I have already named a short list which embodies these requirements in a marked degree; but the classification of these with reference to each requirement would be more satisfactory; so I present the following lists, which can be extended or modified for different localities. This suits North Texas:

Best Shippers.—Early—Alexander, Louise, Hyne's Surprise, Bishop, Pansy Pabor, Lady Ingold, Yellow St. John, Troth, Mt. Rose, Governor Briggs, Foster, Elberta, Mrs. Brett. Medium—Oldmixon Free, Druid Hill, Wheatland, Stump, Columbia, Onderdonk, Scruggs, Princess (of Wales), Cabler's Indian. Late—Gaylord, Ward's, Picquet's, Ringgold, Salway, Crimson Beauty. Very Late—Henrietta (Levy), Bonanza, Lonoke, Tinsley, Yellow Cobbler, Austin's Late, Nix's Late. The latter four can be ripened only in the south or California, where frost does not come till late in November or December.

Best Evaporaters.—These must be solid and full of meat to give a heavy product. They should be large with small seed, and preferably freestones. I name in about the order of ripening, Pansy Pabor, Lady Ingold, Yellow St. John (these are frequently killed in bud by frost, but otherwise are fine), Bishop, Mt. Rose, Governor Briggs, Foster, Early Crawford, Elberta, Mrs. Brett, Family Favorite, Oldmixon Free, Reeves' Favorite, Wheatland, Columbia, California, Scruggs, Princess, Walker, Gaylord, Ward, Picquet, Salway, Ringgold, Crimson Beauty, Henrietta, Bonanza.

Best Canners.—These should have little or no red coloring in the flesh either next the skin or seed, and are comparatively few. Mountain Rose, Oldmixon Free, Mrs. Brett, Family Favorite, Governor Briggs, Elberta, Crawford, Reeves, Wheatland, Stump, Druid Hill, Princess, Walker, Columbia, Onderdonk, California, Ringgold, Picquet, Salway, Bonanza.

I always omit Heath when I name Ringgold, as the latter—formerly called Wilkins' Ringgold Mammoth Cling—is a decided improvement. There are many other excellent varieties not mentioned. The above are numerous enough. One can not go astray if he will take only those which are named in every division, except he would have to add some of the early market sorts if he wishes to ship first.

Well, we have about reached, by circumlocution, the conclusion with which we started—that man will continue to eat peaches, and that the further into the future he gets, the better will be his varieties and the more he will consume. But the increase in population and demand will probably outrun the supply, and the price will continue to advance, so that the intelligent and enterprising peach-grower will ever prosper.

DISCUSSION ON PEACHES.

Major Holsinger, of Kansas—A strip of wire mosquito netting fastened around the trunk of the tree, at the collar, will prevent the borers from laying their eggs and save the tree from their injuries. I know of no new method of guarding against the curculio. Catching in nets and killing is the only certain remedy. A great many trees can be freed from the curculio in a few hours of judicious industry.

President Earle, of Illinois—Has California the curculio pest?

Prof. Husmann, of California—I have resided in this state seven years, and, while I have kept a sharp lookout for curculios, I have never found one. There is something in our soil or climate, or both, that does not favor his peculiar enterprise. We are perfectly willing that he shall remain with you of the east.

Mr. Pryal, of California—I also agree in stating that I have never been able to find it, and I consider that none of that class of insects thrive in this state, as I have seen similar species imported from Japan and Australia, but they have never remained.

Mr. Coates, of California—The curl-leaf and peach moth are all we have had to contend with thus far. The peach moth has appeared during the last few years, and there is no remedy which is entirely successful in exterminating them. The curl-leaf is a subject of constant discussion among our local growers, and they always reach the conclusion that it is entirely confined to certain varieties, and does not spread generally. What we want in the line of new peach varieties is something later than the Salway. We want to lengthen our season, both for shippers and canners. Now we pick peaches nearly as late as November. Our best varieties are those which originated in this state.

The President—Let me ask what is your earliest shipping peach in California?

Mr. Coates—Our earliest peach is the Alexander, which is our only really good early peach.

Mr. Smith, of California—We begin shipping about the last of June, shipping the Crawfords and Fosters first.

Mr. Coates—In answer to a question as to whether the acreage of peaches in California is increasing, I would say that the product this year was greater than ever before, and the demand is also increasing.

Mr. Smith—The eastern demand is for a good yellow freestone.

The President—Is it profitable to ship freestones to the far eastern points, such as Boston?

Mr. Smith—We find that we can sometimes put good freestones into the eastern markets profitably. I find that we have to pick them much earlier to send them to the east than for home consump-

tion, and so they do not always arrive in as perfect condition as they ought.

Mr. Barnard, of Nebraska—What is considered the best fruit-drier on this coast?

Mr. Smith—The one they call "Old Sol." We have no better evaporator than the sun, except in those localities where it is foggy. I do not know all the kinds, but where I live thirteen evaporators were put up this year, and before the year was over they were all laid aside. I dried apricots in the sun this season thoroughly in three or four days.

President Earle—Do California fruit-growers resort to thinning?

Mr. Smith—Yes, every year. One of the greatest difficulties we find is to keep our trees from bearing too heavily. We practice thinning regularly every year. The peach crop is a sure crop in the central counties, as sure as the corn crop in Illinois, but in some of the counties along the coast it is not always so sure. The rule in thinning is to leave no two peaches closer than six inches. We prune the trees regularly, cutting away from one-half to two-thirds of the previous year's growth. The cultivation of peaches and apricots is about equally profitable.

Mr. Ohmer, of Ohio—I have tried to grow peaches, but do not do it now, owing to their freezing. I prefer good dried peaches to the canned fruit. This year I bought California dried peaches, which were the best I ever tasted, and I am surprised that you do not dry more of them. I have never yet bought a fresh peach from California which I liked as much as those dried peaches, because they have to be picked too early.

Mr. Van Deman, of Washington, D. C.—The disease called the yellows prevails in the central Atlantic states, also on the eastern shores of the great lakes. It is a very formidable disease, the origin of which is not certainly known. It is supposed to be due to some bacterial cause. The first sign upon the trees is the appearance of ripening before the peaches are mature, when about half grown. The leaves do not reach their proper size, and have a certain appearance of wiry shoots on the tree. It will first attack one tree, and perhaps may be soon seen on the surrounding trees, although some-

times it may be two years before it spreads to any great extent. It is generally conceded to be contagious, although some people claim that it is not. The curl-leaf frequently occurs after a cold spell as a swelling of the veins.

Mr. Gray, of California—We have a disease which some have thought to be yellows. Examination shows the roots to be first affected, jelly-like lumps appearing at the surface of the ground. It seems to be contagious.

Major Evans, of Missouri—The yellows seems not to have crossed the Mississippi river. The curl-leaf may be cured by removing the earth about the trunk of the tree and filling the basin with hot lye.

Major Holsinger—In case of the true yellows the exudation of gum takes place along the main branches and not at the collar. I suspect Mr. Gray's trees are affected with the peach tree borer.

Mr. Gray—The disease I referred to appears to be a fungus, and not the work of a borer.

Mr. Goodman, of Missouri—The yellows is contagious under certain circumstances. In Michigan the application of wood ashes is claimed to be a remedy.

Mr. Sweet, of Ohio—The yellows exists in Ohio, and it is not cured by ashes, either. The only sure remedy is to make ashes of the diseased trees and use them as a fertilizer for other trees. It is a fatal contagious disease, and I advise California fruit-growers to exterminate the diseased trees on the first appearance of the yellows.

Mr. Watson, of Oregon—The peach is a favorite fruit and is valuable in many portions of Oregon. The peach-growing interest is now growing rapidly. A fungus blight sometimes destroys our crops. I have produced from four acres of Early Crawfords 1,504 twenty-pound boxes of fruit, which sold for an average of $750 per acre. The best time for pruning in Oregon is just after the fruit is gathered. Severe winters are our greatest enemy.

Mr. Budd, of New Jersey—Our peach interest has suffered greatly in New Jersey from the yellows. The best remedy known to our people is the application of muriate of potash.

Mr. Stevens, of Texas—Wood ashes is thought to be a remedy for the yellows in Texas, but we are not really sure that we have the true yellows. The disease we have seems to be a root blight.

On motion, the Society adjourned to meet at 9 A. M. to-morrow.

Third Day—Thursday.

MORNING SESSION, January 26.

President Earle called the Society to order at 9 o'clock A. M.

President Earle, of Illinois—At the opening of our sessions here several letters were read from absent friends, among which was one of great interest from W. H. Cassell, of Mississippi. A second and even more interesting letter from him has since come to hand, which I will read:

CANTON, MISS., January 12, 1888.

Parker Earle, Esq., President American Horticultural Society:

DEAR SIR—At the forthcoming meeting of the American Horticultural Society, where there will doubtless be gathered together some of the best pomologists and scientists of this continent, some who are especially familiar with the apple and its diseases, will you please ask for a discussion on the fungoid diseases of this most useful fruit?

In Mississippi, and especially upon the yellow or yellowish red clay soils, there are certain varieties maturing in the fall and winter months that bear good crops of sound, healthy fruit for a few years, then begin to rot, and are ever afterward affected so as to be almost worthless. This rot, seemingly, begins in August or September in one or more spots upon the surface of the fruit, and continues to increase until the whole fruit is decayed. Is there any remedy for this, or, more probably, is there any preventive? May it not be true that in the early life of the tree it imparts sufficient vigor to the growing fruit to enable it successfully to resist the effects of this fungus, whatever it may be; and that as the tree grows older, and its vitality lessens, it fails to do this?

If so, would the application of fertilizers sufficient to maintain a vigorous condition of the tree enable it still to resist this fungus, and continue to produce sound, healthy fruit? Then, what kind of fertilizer and quantity are necessary? This subject may have a wider range of interest than that bounded by state lines or a few degrees of latitude. I know it is of great importance to us in Mississippi, and I have learned the same trouble exists in West Tennessee to some extent. Place of origin does not always exempt a variety. Ben Davis is affected considerably, and so is Shockley. On the bluff formation along the Mississippi river the same varieties seem to do well for a longer period than elsewhere, but finally succumb. Any practical remedy or solution of this problem is greatly to be desired, and we hope good may result from this discussion.

Yery respectfully, yours, &c., WM. H. CASSELL.

The President—The subject presented in this letter should receive attention at this or our Riverside meeting; but for the present we will pass it, and hear a paper from "an old friend of birds and forestry," which Dr. Ridpath will now read:

A FEW THOUGHTS ON BIRDS AND FORESTS.

BY GEORGE W. MINIER, OF ILLINOIS.

Among the many useful and self-abnegating societies of our ever beloved country, none can claim pre-eminence more justly than the American Horticultural Society. And, surely, none can be expected to take a deeper interest in every labor, subject or science which in any way relates to the safety, security and advancement of pomology. Pomona, the goddess of fruits, died with Grecian mythology; but her mantle dropped to earth, "a sacred gift to man."

My memory of Grecian fable is somewhat shaded by the frosts of seventy-five winters; but if I'm not greatly mistaken, the goddess chose her friends from among the beautiful denizens of the air. The (ὄρνις) ornis was her delight, and strange it is that modern pomologists have not all worshiped at her shrine.

To say to this body of thoughtful men that insects are our worst enemies in fruit culture would savor of folly. All know it. All admit it. Well, then, our best friends are those creatures which prey upon and destroy these foes. Here is where the birds come in as our chief allies. Birds may live without man; but man can not live without birds. This truth ought to be patent to every one. It is a delightful thought that nature has adapted every part of creation to a beautiful consistency. That insects are a part of the economy of nature no naturalist will deny. That the keeping them in check is one of our local necessities is also true.

God made the earth rich in plants, and beautiful in forests, and graciously granted man the privilege of laboring for his sustenance. Man is, therefore, compelled to labor to smooth the rough and subdue the intractable, to foster and cherish the useful and enjoy the beautiful and the delightful.

Man plants and prunes, cultivates and grafts, and (may I say without irreverence) creates new fruits and flowers? A Pippin is, at least, a manufactured article. The rude Persian crab is given to man; he takes the unsavory fruit from the hand of Dame Nature and from it manufactures the Maiden's Blush, the Baldwin and Ben Davis. Myriads of insects (creatures cut *into*, not in *two*) start to life and prey upon his labors. Our remedy is to invoke nature to give us a remedy, and, lo! the air is alive with beautiful, helpful creatures. They herald their arrival with the sweetest music, and thank their Creator in songs of praise for the *privilege* of aiding the only creature made in His image in his toil to "subdue the earth." Birds ask no protection. They simply demand to be let alone—not in the sense of a certain ex-President, but merely to be permitted to rear their nestlings in trees and verdure planted by the hand of nature's God, and this, too, by destroying man's most potent foe. Insects are more destructive than lions. Millions will not pay the annual loss by the chinch-bug (*Cimex lectularius*) only.

For at least three months they destroy so vast an amount of insects that the accounts of ornithology seem fabulous. Audubon, the highest authority on birds, assures us that a woodcock will eat its own weight in insects in a single night. Dr. Bradley tells us that woodpeckers are constantly ridding the orchards of insects.

To preserve our birds we must preserve our forests. Trees are the natural home of birds, and, with the exception of the aquatic tribe, their *only* home.

Gentleman of the American Horticultural Society, there is a great issue—a suit before the tribunal of men of thought. It is not so much a question of expediency as it is of justice. The title of said suit is, "Birds *vs.* Worms." A part of that court is here and now in session. What will the verdict be? It *can not* be decided to-day. The jury is not all impaneled. Indeed, the court is not all present. Millions of American boys are to be educated to a high point of national discrimination and discernment before the testimony is all in. Thousands of grown men are not yet competent jurors. Some nuisances are to be abated before we are ready for trial. The shotgun must be *abated*, if not abolished; and *woman* must be taught not to decorate her hat with the symbol of the life blood of her best friend.

And now, in conclusion, do you ask which birds shall be fostered and preserved, and which, if any, may be destroyed? Save all except, perhaps, a few birds of prey, and two others. The sap-sucker (*Sphyrapicus varius*) I regard as an unmitigated scamp, fit only for power and shot. And last of all, "the worst pill in the box," the English sparrow (*Fringilla domestica*). He is the sum of all ornithological rascality, and deserves nothing good at your hands. There is one apology for him, and that is no virtue of his: Like the African, he came not of his own free will. Some villainous white man captured and brought him, or else some governmental dude got an appropriation through congress, and spent, perhaps, a moiety of it in *this*, the second worst importation that ever vexed the seas, and came to America.

The following letter breathes a hearty spirit:

MANALAPAN, MONMOUTH COUNTY, N. J., December 8, 1887.

George W. Minier, Minier, Ill.:

DEAR SIR—In reply to your inquiries, would say that the only bird considered injurious to agriculture or horticulture in New Jersey is the English sparrow. At the last annual meeting of the State Horticultural Society the following resolution was adopted, viz.:

"That the two Directors from this Society to the State Board of Agriculture be and are hereby appointed a committee for the purpose of uniting with a like committee from the board in asking the legislature of this state to enact a law placing a bounty of two cents for each and every English sparrow killed in this state, payable by the several justices of the peace throughout the state."

It was the opinion of the Society that the English sparrow is, from its known destructiveness, the greatest pest now known to horticulture, and that a law for their extermination, to be effectual, should be national; and to this end I hope the Ameri-

can Horticultural Society at its next meeting will petition congress to pass such a law. The birds common in this state are robins, crows, blackbirds, cat-birds, quails, thrushes, wrens, martins. Your reference to New Jersey leads me to say, "we are proud of our Jersey women." Very truly yours, DAVID BAIRD.

DISCUSSION ON BIRDS.

President Earle, of Illinois—This is one of our best papers. Father Minier is an able and honorable representative American horticulturist.

Mr. Holsinger, of Kansas—I wish the author of the article had described the bird which he calls the sap-sucker, for the bird which usually goes by that name is so far from being a pest that he is one of the most useful birds we have. He is a busy bird on warm winter days, and feeds chiefly upon the larvæ of insects and borers, which he extracts from dead and decaying trees at a time when other birds are doing no work at all.

Mr. Ragan, of Indiana—There are several species of woodpeckers which are called sap-suckers, but the true sap-sucker feeds only on the cambium of the tree. He is difficult to recognize, as he differs from the others chiefly in the formation of the tongue. Woodpeckers have long, elastic tongues, terminating in a barb. The sap-sucker has a short tongue without the barb, the end of the tongue being a small horny spoon or brush. The essayist is correct in asserting that the sap-sucker is a destructive bird.

Mr. Holsinger—Unless we can determine accurately one bird from another by sight, had we not better save them all, lest we destroy our friends?

Mr. Van Deman, U. S. Pomologist, Washington, D. C.—The sap-sucker bores holes (for sap, and not for worms) with geometrical regularity around the trunk of a tree, and the other woodpeckers are searching for insects only in dead and decaying trees. The sap-sucker is speckled white and black and has a white spot in his head.

Mr. J. C. Evans, of Missouri—Another way to distinguish them is that the tail of the sap-sucker is provided with a spike, with which he balances himself on the tree in a peculiar way. His color is a dingy Dominique or Plymouth Rock.

Prof. Lemmon, of California—The sap-sucker is bad in California. He injures forest trees as well as fruit and ornamental trees. This injurious sap-sucker is smaller than most other species of woodpeckers.

Prof. J. C. Ridpath, of Indiana—Mr. Holsinger is right. There are other birds that make holes in trees like those of the sap-sucker, and until we have better knowledge on the subject it would be wiser not to destroy any of the woodpeckers.

Mr. Van Deman—Prof. Ridpath is mistaken. Woodpeckers bore holes wherever they can find a worm. These holes are not bored at geometrical distances, and with the regularity of the sap-sucker.

Mr. Smith, of Wisconsin—Is the robin in this state a destructive bird?

Mr. Buck, of California—Robins with us are birds of passage. Generally we have a few in the winter, but occasionally I have seen them in large numbers. They are not destructive; but the sap-sucker is one of our worst enemies, and often entirely destroys the apricot trees.

Mr. Grimes, of Minnesota—The sap-sucker should be destroyed, and can easily be distinguished by the geometrical regularity of the distances between the holes which he bores. Sometimes they will bore as many as half a dozen rings around a tree, thus impeding circulation and causing the death of the tree. The only objection to birds is that they are destructive of small fruits; but they more than pay for what they eat, and should be protected.

Mr. Smith—There are a great many birds on my place, where I permit no boys with shotguns, and as we are very careful not to disturb them we can approach within ten feet of the robins before they will fly. I have even moved birds' nests from one place to another, and the old birds have returned to them. They sometimes eat my Delaware grapes, but I think this is a proof of good taste on their part, and do not seek to destroy them.

Mr. Estee, of California—Sap-suckers are destructive. I am in favor of killing them to save the trees; but our most destructive bird in Napa valley is the linnet. In the earlier years of California

history a man could not have children enough to frighten the linnets away; but of late years we have planted so many cherry trees and have such large crops that we and the linnets have now an honest living between us. To compass this end required as much patience as the man had who undertook to make ministers out of fifteen bad boys.

[NOTE.—In view of the confusion existing among horticulturists in regard to the identity and habits of this bird, so frequently confounded with an innocent member of the woodpecker family, the Secretary quotes from the transactions of the Indiana Horticultural Society for 1879, page 134, a general description of the family, as given by Alembert W. Brayton, B. S., M. D., in "A Catalogue of the Birds of Indiana, with keys and descriptions of the groups of greatest interest to the horticulturist:"

"*The Woodpeckers.*—Bill stout, usually straight, with the tip truncate or acute fitted for hammering or boring in wood; tongue long, flattish, barbed, capable of great protrusion, adapted to securing insects (except in *Sphyrapicus*); hyoid apparatus peculiar, its bones generally quite long, curving around the skull behind; feet zygodoctyle; outer toe permanently reversed, hind toe present (except in *Picoides*); claws compressed, sharp and strong. Tail feathers 12, rigid and acuminate; outer pair short, concealed; tail never forked; nasal tufts usually present. Chiefly arboreal. All (except *Sphyrapicus*, which is truly a sap-sucker) are preeminently insectivorous, and hence they are of the greatest service to the farmer. Voice loud, and often harsh. Colors generally bright, the male having almost always red on the head; sexes usually slightly different. Species 250; abundant almost everywhere."

Of *Sphyrapicus varius* (yellow-bellied woodpecker), the mischievous member, excepted above from those having flexible, barbed tongues, Dr. Brayton further says: "Tongue not extensible, the tip brushy; hyoid bones short; black and white above, black on breast, chiefly yellowish below; white wing patch; crown red in adult, scarlet in female; 8¼ inches long. This bird is an exception to the rule that the woodpeckers work in the interest of the fruit-grower. He is a true sap-sucker; the hairy and downy woodpeckers do not deserve the name. The yellow-bellied sap-suckers eat fruits and insects. They injure fruit trees by stripping off the outer bark and eating the soft inner bark (*Cambium layer*)."

—SECRETARY.]

Prof. Kinney, of California, chairman of the Committee on Forestry, submitted the following preamble and resolutions:

REPORT OF THE COMMITTEE ON FORESTRY.

WHEREAS, It is now known that a due proportion of forest, varying from one-fifth to one-fourth of the area of a given locality, is estimated to secure the largest agricultural returns and the maintenance of the largest population in the whole district, and that deforestation exceeding this proportion diminishes the total out-

put of crops, even though the cultivated area be increased, and consequently diminishes the capacity of the land to support population; and

WHEREAS, Excessive tree destruction without regard to the maintenance of the reproductive power of the forest causes irregularity and uncertainty in the rain-fall, diminished wood and timber supply for the future, diminished humidity in the air, diminished health of the people, especially through the production of malarial diseases, diminished spring and summer flow of streams used for navigation and irrigation, increased extremes of heat and cold, of drought and flood, and in mountainous countries like California causes the production of torrents that carry débris from the denuded water sheds to cover and destroy fertile valley lands below; and

WHEREAS, The present government land laws furnish neither an adequate means of carrying on the timber industry nor any means for protecting the watersheds, and consequently the irrigation and inland navigation, nor the climate and crops of the country; and

WHEREAS, Timber lands are being rapidly taken up by questionable means, frequently in the interest of foreign capital; therefore, be it

Resolved, That the American Horticultural Society, in convention assembled, calls the attention of congress to this subject of vital importance to the country, and requests that all government timber lands be at once withdrawn from sale or entry, and that the mining act granting timber to locaters be repealed, until a definite survey shall have ascertained what portions of the public forests should be permanently reserved for the best interests of the nation; and that when such forest areas shall be definitely ascertained they shall be set apart and managed in accordance with such regulations as have been suggested and verified by the experience of other nations. The questionable means necessary to obtain large bodies of timber land now so energetically practiced, together with the waste and destruction and fires, make this or a similar measure one of urgency.

Resolved, That congress is further requested to create a special forest reserve in the far-famed redwood districts of California.

ABBOTT KINNEY,
T. S. HUBBARD,
J. M. SMITH,
T. V. MUNSON,
J. CLARK RIDPATH.

Resolved, That the preamble and resolutions herewith presented be printed and handed as soon as possible to the members present and sent to those absent, with the request that the resolutions be forwarded to the members of congress whom they know, or who represent their district, urging action; also, that copies be forwarded directly to the chairmen of the Committees on Public Lands in the senate and house of representatives, and the Secretary of the Interior, the Commissioner of Agriculture and chief of the bureau of forestry.

DISCUSSION ON THE FORESTRY RESOLUTIONS.

Mr. Van Deman, U. S. Pomologist, Washington, D. C.—I heartily indorse the report. Congress should perpetually preserve the big trees of California.

Mr. Buck, of California—Special mention should be made of the redwood forests of this state in a separate resolution. It is not best to endanger the resolutions by any special amendments.

Dr. Ridpath, of Indiana—We made the report short so as not to create dissensions.

Mr. Estee, of California—I wish to add the following amendment, and move its adoption:

Resolved, That Congress is further requested to create a special forest reserve in the far-famed redwood districts of California. [See resolutions.]

Mr. Buck—Most of the redwood forests are now individual property. Congress can, therefore, do nothing in this matter.

Mr. Pryal, of California—Forestry is profitable in Europe, and will be here eventually. Some landlords there require two trees to be planted to one that is cut down.

The resolutions as amended were adopted.

Prof. Lemmon, being called upon, read the following paper:

THE PALMS.

A PHYSIOGNOMIC SKETCH.

BY JOSEPH ALBRECHT, M. D., OF LOUISIANA.

The plant vesture of the earth has peculiar beauties and characteristic forms in every zone. In the tropics these impose by their grandeur and abundance, by their unbounded wealth of grace of forms and of fragrance, by their perennial growth, by the never-ceasing power with which leaf, flower and fruit throng in continuous succession without ever-pausing development.

More modest is the vegetation of the temperate zone. Yet this is not without splendor and variety; and what lack she shows in continuous power of reproduction, as compared with her sister tropical zone, she compensates by the changes which she displays with the varying seasons.

If, finally, we direct our regards to the polar zone, we meet there, also, a rich plant life, strongly diminished and variously stunted in its form, indeed, but, nevertheless, furnishing striking evidence of the never-resting creative power of nature.

In the tropics—that climate which our fantasy paints so vividly as the cradle of the human race—none of the manifold forms of plants we meet is so peculiar and characteristic as that of the palms. I will endeavor to bring

before you the principal outlines of the forms of these plants. I will also mention the architectonic relation of their internal structure, their distribution and their propagation, their relation to the human race, their influence on the physical and moral energies of mankind, or, briefly, their historic mission in nature.

Few plants have more impressively influenced the welfare or woe of whole nations, and are still influencing them, few have more powerfully united in sisterly union the ideas of whole tribes, and more deeply founded an independent direction of thought, than have the palms. Few men have reflected how the palms have proved at once the motives to profound thinking on the symbolism of a religious culture, and on some of the glories of artistic production.

The great father of systematic botany, the immortal Linnæus, called the palms the princes of the vegetable kingdom. By this he has created an image of palms which will remain everlasting, for there is no better verbal mode of distinguishing the palm from all other plants. Wherever the palm appears in its truly typic and unstunted form, it distinguishes itself by its port and carriage from all growing around. The undivided stem, which rises continually in height, without bearing limbs, and lifts its crown of leaves proudly up without ever dropping them, imprints on the palm its peculiar stamp.

Some of our tallest palms delight to stand isolated, and to govern the landscape for a great distance. They like to raise above the surrounding jungles their heads, bathed in the sunlight, where they form, as Humboldt says, a forest above the forest. Yet it must not be hastily inferred that it any the less presents vast bodies of glorious fronds to contemplation. Sir Samuel W. Baker, who spent many years in the island, says: "For upwards of a hundred and twenty miles along the western and southern coasts of Ceylon one continuous line of cocoa-nut groves wave their green leaves to the sea breeze without a break, except where some broad, clear river cleaves the line of verdure as it meets the sea." At the same time, what he elsewhere says is not to be forgotten: "This palm delights in the sea breeze, and never attains the same perfection inland that it does in the vicinity of the coast." More definitely other authors affirm that this body of Cocos nucifera is twenty-six leagues long and several leagues broad, and comprehends some 11 000,000 trees. But it is chiefly the dwarf palms which grow in great masses. The Sabal, Adansonii and Serrulata and the Chamærops hystrix form almost impenetrable thickets as undergrowth in the swampy forests of lower Louisiana and Florida, and the Chamærops humilis has taken possession of large tracts of land in the French province of Algiers, to the exclusion of all other plants, and is the despair of the colonist who tries to clear the land for cultivation. In the marshy parts of the Philippines and other large islands near them, and the Moluccas, there are wide tracts entirely covered with the Nipa palm (*Nipa frutescens*). Among other social dwarf palms

may be named the Geonoma acaulis, Macrostachia, Trinax argentea, Chamærops argentea, Phœnix acaulis, Licuala paludosa, etc., and among the tree palms the Phœnix dactylifera, P. sylvestris, Elæis guineensis, Iriartea phæocarpa, Euterpe, Syagrus botryophora, Attalea spinosa, A. excelsa, A. compta, A. phalerata, Cahune, Mauritia vinifera, M. flexuosa, Orbignia phalerata, Copernicia cerifera, Cocos Yutai, Corypha Gebanga, Areca Nibung, etc.

Such varied features give the palms an independent stamp, and make them, with their carriage, the character plants, not only of a landscape, but of whole countries. The proud, royal form of some palms is often developed from a very small germ. Those of our peas or beans are giants compared with it. If we look closely at the stone of a date we observe on its rounded back a small cavity, and cutting through the horny substance of the seed we perceive a small whitish corpuscle. This is the germ. The substance of the stone is the albumen and starch which furnish nourishment to the germinating plant. It is, indeed, the same substance as the flour of the cerealia, and which has a fleshy or oily constitution in many other plants. The germ of the palm develops very slowly into a tree. Years often pass before the plant begins to form the stem, and the body of the stock has increased to considerable thickness before it rises up to a stem like, rounded shaft.

Of the shooting up of the young plant into a woody twig, as we see even during the first year with our fruit and forest trees, not a trace can be observed in the palms. But once the stem commences to form, it grows on and on in yearly swelling height, pushing forth on its summit ever green new leaves; and in this manner, at last, after many years, running on to centuries almost, the mighty columns of 100, 150 and even 190 feet high are developed, with their large capital of leaves on the summit, which we can not but so much admire.

The conception is so very general that the palm always appears as a tall, straight column, which terminates in a cluster of leaves, that no other form is thought of. But we have a great number of palms which have quite a different growth. Many never show above the soil more than their crown of leaves; other forms are those of the climbing palms or rattans. The well-known Spanish cane (sometimes wrongly called bamboo) is the stem of such a palm. This cane, as do others of the same tribe, climbs like an endless, tenacious rope of several hundred feet in length, in the forests of the tropical zone, particularly in southern Asia. From stem to stem, from crown to crown, it winds its way, not seldom through several mighty forest monarchs, passing between their limbs in great sinuous arches. These stems of the climbing palms are the longest vegetable growths in the world, and if stretched out would often measure 500 and 600 feet in extent.

As a freak of nature, a few palms occasionally divide into two or more branches, as is constant and typic with the Doum palm (*Hyphæne thebaica*) of northern Africa, and particularly of the valley of the Nile, and of Nubia, Abyssinia and Arabia. We see this palm forming one of the decorations of the Egyptian provinces, and at the cataracts of the Nile it stands isolated,

looking down into the never-resting billows below. Welwitsch, on the other hand, tells that in the parched districts between the rivers Dande and Zanza he saw a forest of a kind of Hyphæne some five leagues in length, consisting almost exclusively of the branched stems of this peculiar palm.

Some palms have a gourd-like swelling in the mid le, or near the middle, of their stems. We see in the yards of the convents of Chili, now and then, the showy crown of the Coquite palm (*Subaca spectabilis*), with gray-green pinnate leaves, which has such a stem. In the savannas of central Africa rises the grandiose Delib palm (*Borassus Arthiopum*), and balances its gigantic fan leaves on a high columnar stem, which shows a little below the middle of its height a swelling, which gradually and gently diminishes upward and downward. This formation gives such strength to the trunk that the strongest hurricane can not bend it.

The mild and tender nature which distinguishes the palms and makes them so attractive to men is not always present. Many stems of palms bristle with thorns, with which they confront and oppose the traveler who comes within their reach. Among these are the Desmoncus, Bactris, Guilielma, Acrocomia, Astrocaryum, Aiphanes, Listonia Hagendorfii, Martinezia caryotifolia, etc. The spines shoot like huge fangs forward on many stems; on others they are fine-pointed, like the sharpest needles, which the Indians often use to tattoo with, or to puncture the skin before rubbing a dye in the wounds.

The petioles, or stems of the leaves, of many palms remain on the stem for a long time after the green leaves have perished. They frequently sharpen into thorny points, as is the case in the Chamærops hystrix of Louisiana and Florida. On other palms the bases of the leaf stalks remain on the trunks, and give the surface of the trunks the appearance of being furnished with steps. These steps facilitate the climbing of these trees, and the dwellers of the torrid zone by them mount up to get the nourishing fruit, or to draw off the palm wine from the sheath of the flower. The leaf stalks in another great number of palms envelop its stem entirely, and form, when extended, broad fibrous sheets. The leaf stalk of the Oreodoxa regia of Cuba is three to four yards wide, and much used to pack up the fragrant weed of Vueltabajo. The tree drops one leaf every month.

Wax is best known as the product of the honey-bee, but certain plants probably produced wax long before bees began their quiet activity, and some plants produce it still to a large extent. The palms are among the most important wax-producing plants. The Peruvian wax palm (*Ceroxylon andicola*) is entirely covered with a whitish wax, which gives it the appearance of marble. A single stem of this palm furnishes twenty-five pounds of wax. This wax is scraped from the stem and mixed with tallow for candles.

Von Martius says, informing us of another extraordinary presentation among the palms: "Characteristic differences are also furnished in some species by roots which, springing from the stem at about a foot or a foot and

a half above the ground, either raise the stem, as it were, upon a scaffolding, or surround it with thick buttresses." Far more wonderful accounts of this strange phenomenon have been observed by others. Mr. A. Smith says of the Iriartea exorrhiza that it "is the tallest-growing species, and its cone of roots is sometimes so high that a man can stand in the center with the tall trees above his head. These aërial roots, being covered with little asperities, are commonly used by the Indians as graters."

Mr. Berthold Seeman tells us that he became acquainted with a singular instrument when he made an excursion one evening through Panama. This instrument was used by his native servant to crush cocoa-nut kernels to a pulp to prepare them for food. It had somewhat of a resemblance to a cylinder full of prickles, as we see pins in the barrels of street organs or music-boxes. Seeman would never have imagined what it in reality was. It was an aërial root of a palm. Later on he saw the tree himself, and could study more closely its formation; it was the air-root of the Pashinba or Zamara palm (*Iriartea exorrhiza*).

Dr. Siegfr Reissek thinks that the trunks of many palms in advanced age die entirely away near the ground, and are reduced to dust, so that nothing remains of the original tree to the height of four to six feet. These are the palms which stand single. It has been asked, how can they stand erect, and continue to grow, being deprived of their supporting base and roots? It has been replied that they have had to create a new *point d'appui* and new organs of nutrition, and that their stems have thrown out air roots, such as we observe sometimes on the stalks of our corn, and that these they have implanted in the soil during the decay of the base of the trunk.

We see stems of the Iriartea on conic scaffolds of aërial roots which have fastened themselves solidly in the soil on all sides. The view of such a scaffold of roots may be compared with the frame of a tent made of conically converging poles. The trunk is now suspended entirely free from the soil on this scaffold of roots, and is in this manner raised often six or seven feet from the ground, carrying a stem of sixty or seventy feet free in the air.

The traits which we have just cited of the stem of the palms show sufficiently that they differ entirely from the trunks of our forest trees. This difference extends not only to its external appearance, but also to its internal structure. We look in vain for wood in palms, as we possess it in our trees; in vain for a bark, as on our trees. No heart, with its yearly layers of rings, is to be found; no bark which can be separated from the wood. The whole body of the trunk of the palm may be considered as a gigantic bundle of fibers inclosed in a hard shell. If we cut a Spanish cane across, we can see very well how the fibers run and how the stem is constructed. It may be compared to artificial whalebone, consisting of horse-hair glued and pressed together.

The peculiar structure of the palm stem, which corresponds with the type of the Monocotyledons, is not without intrinsic influence on certain of its external phenomena. The trunk of the palm is elastic and flexible in a

high degree. Strong old palm trees bend in the wind far below the line in which our forest trees could retain their entirety, while young trees are as yielding and pliable as grass halms. The stems of our trees would break if they were bent as much as any of them. Headless trunks, or forest giants broken and uprooted by the storm, as we meet them in our forests, are unknown in the world of palms. The palm remains standing erect when the tropical hurricane shivers the forest around him to pieces, and when other trees are broken asunder. The deficiency of a woody body, as in our trees, does not withdraw from the palm that degree of solidity and hardness which is indispensable to it to maintain its position, and to brave the attacks of storms. Its solidity is, on the contrary, a very extraordinary one. The wood of certain palms belongs to the hardest we know. The best ax is notched or gets its edge turned in attempts to cut some of them, as the Guilielma speciosa or peach palm of Venezuela and Guiana.

On the high shaft of the tree palm, as well as on the climbing stem which winds itself through the thickets of the forest, the palm unfolds its crown of leaves. On the arborescent palm it corresponds with the architectonic capital. Some palm leaves resemble long drawn out spades, as in the Lodoicea and Phœnicophorium Sechellarum and Verschaffeltia sporida, in which they are sometimes upward of twenty feet long and twelve feet wide. Others may be compared with the leaves of our parsley, only magnified a hundred-fold, as in the Caryotas and Martinezia caryotifolia. But the two principal forms are the fan-leaved and the pinnate-leaved palms. The fan-leaved carry green fans, the pinnate-leaved green feathers. A lady's fan, whose rays are drawn out in long points, gives us an image of the fan leaf, and an ostrich feather, which we have to imagine immensely lengthened, and its downy divisions put further apart and transformed into green leaves, gives us an idea of the pinnate palm leaf. Of the fan-leaved palms we have in the United States the Sabal palmetto, the S. Adansonii, S. serrulata and the Chamærops hystrix.

In the formation of the palm leaf the structure of the leaves celebrates its triumphs, for no larger leaves are met with in the vegetable kingdom. It seems as if nature intended to indemnify the palms for the deficiency of a crown of branches by the grandeur of the organs of the leaves, so gigantically and massively are they built. There are palm leaves which fairly vie in size with many of our fruit trees. Put up in our orchards they would reach far above the tops of the trees. The leaves of the Jupati palm (*Raphia tædigera*), a pinnate-leaved palm of Brazil, attain a length of sixty feet or more, and form a feather crown of forty feet in diameter. Its leaf stalk or petiole shoots out twelve to fifteen feet before the first segments of the leaf make their appearance. We could easily climb up to the second story of our houses on the prongs of the leaf stalk of the Sagus or the Arenga palm (*A. saccharifera*). No less majestic are the fan leaves of those palms which, though not so long, spread more in breadth. The round green fan leaves hover about the head of the palm, and when shaken by the wind send

on all sides flashing gleams from the glossy surface of their leaves. The royal forms of the Palmyra, the Sabal, the Latania, etc., carry fans from twelve to fifteen feet in breadth. Ten persons can conveniently stand under the leaf of a Talipat palm (*Corypha umbraculifera*). The navigators of the Upper Nile set up the leaves of the Delip palm as a screen to make shade under which to rest.

Nature has not only prepared parasols, but also paper, in the leaves of the palm, especially of the Talipat, Palmyra, Borassus flabilliformis and Cocos. These consist of long strips from the leaves, so as to serve the Hindoos for writing material, as El Babir, the papyrus—whence the word paper—did the Egyptians. The strips are smoothed, and the writing is engraved on its surface with a stylus. The writing is afterward rubbed with a black mixture to make it more distinct. The merchant keeps his books on these prepared slips or olas—the native name for them—and the craftsman writes on it his account, which, in spite of the small tamulic characters, produces the same impressive effect as a European civilized account would. Even many tender secrets are confided to the green leaf, which, neatly rolled up and sealed, finds its delivery through the post-office as well as our letters. I will here remark that this manner of writing may well be one of the oldest, if not the oldest, according to Pliny. The oldest of writing on palm leaves has to be put, according to Indian authorities, at thousands of years before the historic era.

We plant our cabbage in our gardens on the ground; the inhabitant of the tropics gets his cabbage on the top of palm trees, especially the Areca oleracea, Cocos oleracea, Euterpe oleracea and many others. The palm cabbage is the tender heart of the leaves of many palms, but as this heart exists only once, the tree dies when it is taken, and many palm forests have been destroyed by the greediness of man for this product.

The beautiful leaf of the palm is not always so free from danger as may seem at first sight. Many palms, and principally the climbing palms, have thorns on the petioles, which are sharper than the claws of a cat or of a hawk. These thorns are sometimes hidden under the soft segments of the leaf, and, therefore, so much the more dangerous. Ærocomia, Astrocaryum, Bactris, Guilielma, Desmoncus, etc., are genera belonging to this class.

In extraordinary contrast with the size of the leaves are the dimensions of the flowers, or, rather, of the florets, in the palms. These are very small, without remarkable coloration, and would disappear under the magnificence of the leaves if they did not compose large corymbs or racemes, or sometimes dispose in huge spikes. Few palms carry the floral panicle in the center of the shaft (interfrondales), and are, therefore, monocarpous, that is, flower and bear fruit only once in their lives and then die. Palms of this character all belong to the old world, and bloom only at the age of forty or fifty years, such as Corypha, Metroxylon, Eugiessonia. The Sagus blooms at about fifteen years of age; the fruit is nearly three years in ripening, after which the tree dies. Most of the palms produce their flowers (racemes) on the side of

their stem, or in the axils of their leaves (infrafrondales). The presence of the leaves is not always necessary during the flowering and fructification. The leaves drop off on certain palms before the flower spathe appears (Euterpe, Oenocarpus, Areca, Seaforthia, etc.); in others the leaves persist at all times (Arenga, Sagus, Phœnix Mauritia, Borassus, Lodoicea, Latania, Hyphœne, etc.). The racemes of the flowers sometimes attain a gigantic size. The Cryptocalyx of Java sends from the crown a fluttering spike sixteen feet in length, and many others are not much smaller.

The diminutiveness of the flower of the palm must not be considered a defect; it is rather an advantage. Nature operates more through contrast than through harmony. The leaves which give the palm its peculiar majesty would suffer in their effect if large and highly colored flowers were put by their side. The palm flower compensates at least for the deficiency of its size by the enormous number of florets. More than 208,000 were counted on a single raceme of the Sagus Rumphii, which is preserved in the museum at Kew, and as the tree produces commonly three such racemes, the number of florets must have amounted to 624,000.

The sex is mostly separated in the flower of the palms. We find the male and female flower often on one tree (Cocos, Attalea, Areca, Desmoncus, Sagus, Leopoldia, Geonoma, etc.), and often on two separate trees (Phœnix, Chamædoria, Mauritia, Borassus, Lodoicea, Latania, etc.), and, indeed, the differences of the sex in plants was first observed on the palms. It was known to the Egyptians and the Greeks. The spathe and the flowers of several palms exhale a very agreeable musky odor toward evening and morning. Among them are the Ærocomia sclerocarpa, Chamædoria fragrans, Morenia fragrans, Astrocaryum, Diplothemium Bactris, Saguera saccharifera, etc.; but unfortunately not all produce an agreeable, but, on the contrary, some exhale a fetid and putrid, smell (Areca catechu). Some flowers develop a certain amount of heat at the time of inflorescence. It is commonly the spathe which shows the increase of temperature, as in Bactris, Ærocomia, Iriartea.

The maturation of the fruit of the palms is a very slow process. In many palms it requires at least eight months, in Sagus, as already stated, three years and in the Maldivian nut (*Lodoicea Sechellarum*), whose hard, woody shell is two inches in thickness, ten years to mature the fruit.

The fruit is often in great disproportion to the flower. The small flowers of the Borassus, Cocos, Lodoicea and Eugeissonia produce very voluminous fruit. The fruit of the Lodoicea Sechellarum—a very peculiar kind of cocoa-nut—is often half a yard long, a yard in circumference, and weighs over fifty pounds; it is cordiform, and the greatest tree fruit of the world, and known under the names of Maldivian nut or Coco des Maldives, double cocoa-nut and Coco de mer.

Not all fruits of the palms are nuts with a dry and fibrous cover. Others produce berries or drupes, with a fleshy and soft cover inclosing a stony kernel. Some of them are edible, like the drupe of the Phœnix dactylifera

(date), the Desmoncus prunifer, with a subacid sweet flesh, the Guilielma speciosa and others. Still others are covered with neat scales, like the fruit of a pine or a pine-apple, as in Lepidocaryum, Sagus, Calamus, Raphia, Desmoncus, Mauritia, etc.

The palms concentrate themselves in tropical regions, where we meet with the greatest number and the greatest diversity; these diminish as the lines of Cancer and Capricorn are reached, and still decrease as those limits are passed. The most northern limit in America is about 34° north latitude, and the southern 36° south latitude.

The most blessed countries on the earth, which harbor the palms in their greatest abundance, beauty and variety, are, in America, the countries on the Amazon and the Orinoco; in the old world, Farther India and the Sunda islands.

In earlier periods the palms flourished much further north and south, and where now the dreary pine and spruce grow and raise their dark heads stood formerly rich palm forests, as is abundantly proved by their fossilizations in the coal measures.

The number of the known and yet living palms amounts to about 1,500 species, of, according to V. Martius, 64 genera, and according to Dr. Wendtland 119 genera; but as many countries in the interior of Africa, etc., are not yet accessible to the botanist, it is supposed that their number will be increased to about 1,600 species.

How much more might be said on this almost inexhaustible subject I must leave to contemplation. I can only trust I have not exhausted your patience in what I have thus presented before you for your indulgent reception on such an occasion as this.

DISCUSSION ON PALMS.

President Earle, of Illinois—This is a unique and interesting paper, and I can only regret the absence of its able author.

Prof. Lemmon, of California—California has two native palms. The Washington, one of the finest of the fan palms, succeeds in all the warm valleys of the state. Its native home is at the south, at the foot of the San Bernardino Mountains, in what is known as Palm valley. Some of the finest specimens of this species in the state may be seen in this city. Naturally, its majestic columnar body is left rough and rather unsightly for a number of years by the retention of its leaf stalks. This may be remedied by shaving them off without injury to the tree. The second species is also a native of Lower California, but is neither so conspicuous nor hardy as the Washington. As Dr. Albrecht has well said, there are no

trees or plants which present to the beholder such unique beauty and interest as the palms, and where they succeed, as they do in California, they should be seen on every landscape.

Secretary Ragan, of Indiana—It was with some difficulty, and a good deal of persuasion, that Dr. Albrecht was induced to prepare this paper. I apprehend that no member of the Society will regret that he finally did so. There are, probably, not many of the palms that will prove of economic value in the United States, but they are certainly of great æsthetic value wherever the climate will admit of their being grown. There is at least one of their number, however, from which I anticipate valuable economic returns in the near future as a possible fruit-bearing species in a large section of comparatively arid country bordering on the Pacific coast and Mexico, viz.: the date palm. This is one of the most hardy, and certainly *the most valuable*, species of the palms. The region named, in many of its essential features, resembles North Africa, where the date palm is the greatest blessing to the semi-barbaric tribes who inhabit that country. It should be thoroughly tested in these arid regions.

Mr. Van Deman, U. S. Pomologist, Washington, D. C.—I am very much interested in palms. I received the fruit from a date palm grown near Phœnix, Arizona, only seven years from the seed. It had five bunches. I believe this valuable palm will do well in that country. The date palm requires a moist soil and a dry sky; irrigation can give the first, and the other is everywhere in Southern California and Arizona.

The President—Notwithstanding the value that may, and I hope will, develop in date culture in the southern sections of California and Arizona, I still think the greatest value is in the beauty and grandeur of the palms.

Mr. Bettner, of California—In Southern California the date palm succeeds, and has been fruited for a few years past. We certainly have the necessary atmospheric conditions. At Riverside, my home, the culture of the date is receiving some attention.

Mr. Wickson, of California—Date palms were introduced into Southern California by the Jesuit fathers. They have perfected

fruit in Solano and Santa Barbara counties. The tree is of rather slow growth, and does not bear fruit until it has attained considerable age.

Mr. Van Deman—Does the royal palm grow in California?

Mr. Estee, of California—I have eight varieties of palms on my place in Napa, and one of them is called the royal, but I do not know that it is true to name. The last frost cut the lower leaves a little, but it has not been seriously injured. I have found this palm hardy enough in Napa, where there are trees twenty-five years old and forty feet high.

Prof. Thomas, of Arkansas—There are two beautiful specimens of palms on ——— street, in this city. What variety are they?

Prof. Lemmon—Those are the Washington palms, and are probably as fine specimens as any in Central California.

Mr. Wilcox, of California—A number of varieties of palms are grown in this (Santa Clara) county, but no perfect fruit has yet been obtained from the date.

Mr. Bettner—Palm valley, the native home of the Washington palm, referred to by Prof. Lemmon, is near Indio, in the Colorado desert. Many specimens there rise to the height of one hundred feet or more, and are majestically grand.

Mr. Estee, of California, introduced a resolution on the subject of the tariff on fruits, which was, on motion, referred to the following special committee: Mr. Estee, of California; Mr. Buck, of California; Mr. Masters, of Nebraska; Major Evans, of Missouri; and Major Holsinger, of Kansas.

Mr. Barbour, from the local committee on entertainment, gave some information concerning the proposed banquet to be given the Society in the evening; also, regarding the excursion to Monterey and Santa Cruz.

A letter of invitation to the Society to visit Santa Rosa and the redwood forests on the Russian river was received and the invitation accepted. The Society then adjourned.

Third Day—Thursday.

AFTERNOON SESSION.

The Society reassembled at 2 o'clock.

Hon. M. M. Estee, of California, from the special committee on fruit tariff, reported the following resolutions:

Resolved, By the American Horticultural Society, assembled at San José, California, that any reduction by congress of the existing tariff on green and dried fruits, nuts, raisins, prunes, wine, and other horticultural and agricultural products, would injure all and destroy many of these industries.

Resolved, That a copy of this resolution be forwarded to each senator and member of congress, and that a printed copy be sent to each member of the Society, with the request that the subject of the above resolution be urged upon the attention of the senators and members of congress from each of their respective states.

M. M. ESTEE,
J. C. EVANS,
FRANK HOLSINGER,
J. H. MASTERS.

After an able and prolonged discussion, participated in by several gentlemen from California, all of whom favored the resolutions, and by Mr. Munson, of Texas, who opposed them, they were adopted by a very decided majority.

The following supplementary resolution was introduced by a minority of the special committee on the tariff:

Resolved, That it is necessary that a large import duty be imposed on all nursery stocks brought into the United States, as many of these imported stocks bring insect pests into the country and threaten the destruction of our orchards, and at the same time cripple the nursery business of our own people.

M. M. ESTEE,
J. H. MASTERS.

Mr. Masters, of Nebraska—I heartily favor the adoption of this resolution. Many of our worst insect pests have been brought into our country on imported nursery stock.

Dr. Plummer, of Oregon—Our California brethren seem to be already supplied with bugs. They ought not to import any more, either with or without duty.

Mr. Klee, of California—The resolution should be modified so as to require a thorough inspection of all imported nursery stock.

Mr. Lindley, of North Carolina—I believe this discussion to be out of order, and, therefore, move to lay the resolution on the table. Carried.

Mr. Johnson, of Indiana, from the committee on President Earle's address, reported as follows:

Your committee to which was referred the President's address beg leave to report that the questions therein so ably discussed, the recommendations wisely made, and the conclusions reached, are of so much importance to horticulturists throughout our country that we recommend that this Society secure the publication of 3,000 copies in pamphlet form.

J. C. EVANS,
S. JOHNSON,
N. OHMER.

The report of the committee was adopted, and, on motion of Mr. Estee, of California, a collection amounting to $38 was at once taken up to defray the expense of the publication and distribution of the address.

COLD STORAGE AND REFRIGERATOR CARS.

California members desiring to know the effect of cold storage and refrigerator cars on their fruits shipped to distant markets inquired of eastern members concerning the condition of such fruits when received.

President Earle—The common impression that fruits are injured by cold storage is incorrect. They do not necessarily decay more rapidly when exposed to the warm outside atmosphere by reason of having been in the cold storage, unless they have been overripe and in the incipient stages of decay when gathered and shipped. My own experience and observations convince me of the value of thoroughly cooling fruits before shipment. This is true of all classes of fruits, not excepting the strawberry. A refrigerator car simply holds the fruit in abeyance, so that organic action is held back for a time. When the fruit is packed in a firm condition it does not essentially change when taken out, although when the fruit is put in overripe it will not keep long. The success of shipping fruits from this coast to the east would depend largely upon

the kind of cars used and the manner of packing. A refrigerator car is the worst place in the world for fruits after the ice is melted out, as it is then without ventilation, and soon warms up, thus spoiling the fruit very quickly.

Mr. Wilcox, of California—Fresh grapes must be kept dry while in the process of refrigeration. The cold storage establishment at Riverside is quite successful.

The President—Fruit that has been in cold storage or shipped in refrigerator cars should never be reshipped in ordinary cars. Refrigeration is to be used with judgment and care, or bad consequences may result.

Mr. Wilcox—The question of refrigeration is an important one to Californians. Where fruits shipped in refrigerator cars are to be reshipped, it is best to raise the temperature of the car somewhat before transferring the fruit to other cars.

Mr. Feeley, of California—Cold storage has not proved satisfactory to California fruit-growers, as a rule.

Mr. Klee, of California—I think the experience of shippers at Riverside is against cold storage. Lemons and oranges decay rapidly after being taken out of cold storage. California fruits at New Orleans, which were not in cold storage, kept much better than fruits from eastern states, which, as a rule, were so treated. This, however, may have been due, in part, to the extraordinary solidity and good-keeping qualities of fruits grown in this state.

Mr. Van Deman, of Washington, D. C.—The cold storage facilities on the exposition grounds at New Orleans were very inadequate. Arkansas was the only state which availed itself of the opportunities, but, owing to some delay in the preparations, the fruit was greatly decayed before the cold storage application could be made.

The President—Fruits that went into cold storage at New Orleans in good condition came out all right. The process was successful, but the trial given on the exposition grounds was far from satisfactory, owing to bad management.

Mr. Wheeler, of California, by invitation, read the following paper:

THE EDUCATIONAL NEEDS OF THE AMERICAN FARMER.

BY PROF. E. W. HILGARD, OF CALIFORNIA.

The cry for "industrial education" has, within the last twenty years, become almost universal throughout the civilized world. The astonishing progress made in the arts through the application of scientific principles, the powerful influence exerted by technical science in the improvement of old industries and in the development of new ones, and last, but not least, the awakening of the laboring and industrial classes to their claims to something more than the position of hewers of wood and drawers of water, have made that cry penetrate to the innermost recesses even of the most conservative educational institutions. From the kindergarten to the university, the justice of the demand for something beyond the old scholastic training and methods is admitted, and the question is not now whether the long-neglected training of the senses shall form a part of all education, but only how and to what extent it shall be done. I can not doubt that the audience here assembled is a unit on the main issue; but it may not be amiss to discuss somewhat the detailed application of the idea of industrial education to agriculture, concerning which there still exists a great variety of opinion and practice. Such a discussion is the more timely, as the establishment of experiment stations in or out of connection with the previously established agricultural colleges has once more brought the merits and demerits of the latter prominently before the public.

What, then, are the educational needs of the American farmer? I say advisedly his *needs*, and not his *demands*, for in my view the two differ not immaterially in many points, if the utterances of some of their prominent spokesmen may be taken as guides. And in saying this I mean nothing derogatory to either the intentions or the intelligence of these men, or of those whom they represent. What can be accomplished by education outside of the paternal home, and what can and should be its methods, are not matters of common note to be intuitively perceived by every one. On the contrary, these are extremely complex technical questions, and to be found uninformed in respect to their details is no greater reproach than it would be to say that the proper mode of constructing a steam-engine can not be intuitively known. What our farmers do perceive intuitively is that there is evidently something wrong about the old educational system; that it does not teach their children much that bears directly upon their life-pursuit, and that on the whole it seems to have a tendency to alienate them from the farm.

Now, in so far as the school or college omits from its course the training of the senses and perceptive faculties, and the principles that underlie and are called into daily requisition on the farm, the farmer's complaint is well founded. But when by way of remedy he demands that, in order to prevent a diversion of the boy's mind from the farm, he shall be surrounded by a

dense "agricultural atmosphere," through which he shall but dimly discern what other people are doing, and have done in the past; that his horizon, and with it his mind, shall be kept narrowed down to the sphere predestined for him by his parents without his intelligent consent, and that the achievements of the human mind in past ages, from which his present condition has been evolved, shall remain a sealed book to him by the omission, or reduction to a minimum, of culture studies, he unwittingly attempts to defeat, in the most effectual manner, the very aim and purpose for which farmers' organizations throughout the country, and above all that of the Patrons of Husbandry, expressly and loudly contend.

What, in fact, are these aims and demands as set forth in the declaration of purposes of the grange? They may be formulated under the following heads: To secure to the farmers their rightful influence in public affairs; to elevate their pursuit in their own as well as in public estimation; to render it more profitable and less laborious, and more attractive, a special complaint being the tendency of young men to leave the farm for the cities.

The latter and most pregnant fact can not be too closely scrutinized as to its causes. It means, of course, that from some cause farm life, *as it is*, is not attractive to the young, and the reason very commonly assigned was tersely expressed in the answer given me in the premises by an old and very level-headed farmer: "The young rascals don't like hard work!" And yet these same young rascals will go to town and slave as ill-paid clerks or other underlings without any reasonable hope of acquiring a competency before their hairs are gray, and think themselves better off than on the farm, where they would be assured of independence, if not of opulence. As it is proverbially of little use to dispute about tastes, the only debatable questions are, what are the causes of this preference for city life, and how can the farm be rendered more attractive to the young? for, in this country, happily unlike the old, the lines of a young man's life are not, and should not be, laid out for him by virtue of his parentage. The instincts of every American rebel against that kind of predestination, which is the outcome of the fixed class distinctions in the old world. If it is the birthright of every American boy to look upon himself as a possible candidate for the presidency of the United States, how much more is it his right to take his own choice of a life occupation. Neither farmer, merchant nor lawyer has any moral right to claim that his sons should, as a matter of course, follow their father's occupation; in that, as in the choice of a wife, no man can properly act for another who is of sound mind. And in this country, at least, it is not by putting a young man's nose to the grindstone, or by "rubbing it in," that he is likely to be converted either to farming or anything else.

I insist strongly on this, because it is one of the points commonly made against our agricultural colleges that, by offering their students a wider field of study to choose from than would be involved in the professional study of agriculture alone, they "turn farmers' sons away from agriculture." Hence, the demand that these colleges shall be kept apart from the institutions

where other professions are taught, in order that the boys' horizon may be kept circumscribed by a dense "agricultural atmosphere."

Truly, this is a singular method for elevating the pursuit of agriculture, whether in the estimation of the public or of the boys themselves. When plainly formulated, its two fundamental propositions are: *First*, that it is objectionable, or improper, for a farmer's son not to become a farmer, also, even though his natural aptitude might lie in a totally different direction. *Second*, that farming is in any case too lowly and uninviting a pursuit to bear comparison with other occupations; and, hence, these must, if possible, be kept out of the boys' view.

The first proposition is intrinsically obnoxious anywhere, and peculiarly un-American. The second is a stultification of the very claim so strongly and justly insisted on, that farming is an occupation dignified not only by its fundamental importance, but also by the call it makes upon the judgment and intellect when properly understood, and that it makes men independent and self reliant—forms them, in fact, into the very bone and sinew of a republican people.

Farming, when intelligently taught, as when intelligently carried on, need not fear comparison with any other occupation. It is only when the teaching forms merely a somewhat systematized continuation of the dull routine of *unprogressive* farming that the latter suffers in the comparison. The progressive farmers, then, are the last persons that should object to their sons' being taught their profession in the full light of literature and modern science, as is done in most of our agricultural colleges. But these colleges, in number as well as in means, are ridiculously inadequate to cope directly with the real evil complained of, the flight of the boys from the farm, for they can not educate, no matter by what process, any numerically considerable proportion of the agricultural population. Supposing even that it was their particular business to convert every one of their students unto farming, their effect upon the whole population would be only as a drop in the bucket, *unless the superior quality of the education, as well as of the men, should make them the future leaders of their industry.* To educate such men, who, by precept or example, or both, shall lead the way, I consider to be the true province of the agricultural colleges, and by far the most effectual mode of action in the direction desired by the progressive element among the farmers. A little of such leaven of high quality will leaven the whole mass much more effectually than would scores of half-trained men, whose stinted education and half-knowledge would but serve to obscure their practical sense and throw discredit upon rational farming.

If, then, it is physically impossible that the agricultural colleges should educate the rank and file of the agricultural population, and if, on the contrary, they can best serve the cause of agriculture by educating the leaders of progress, is it not obvious that that education should be of the broadest kind, and should qualify the student not merely to be a successful farmer, but should also enable him to cope successfully in public life with the trained

men that other professions put into the field? How can the farmer hope to be effectually represented in the legislative halls of the states, or of the nation, while the bulk of the men occupying these influential positions (and that by virtue of the farmers' votes) are taken from the ranks of other professions? The very fact that farmers themselves habitually select persons from other walks of life to represent them in the legislative councils proves conclusively that they do not at present find within their own ranks men sufficiently well qualified, otherwise than by good intentions, to uphold the interests of their fellows against the well-trained advocates of other interests. If the agricultural colleges were to do no more than to furnish an adequate supply of such well qualified leaders—leaders in agricultural progress as well as in the councils of the nation—they would render the greatest service to the farming population that, with their means, it is possible to accomplish. But more than this: They should, and *do*, supply the much needed contingent of teachers who are trained not only in the ways of the old-time schools, but are imbued with the spirit of industrial science and progress, and will infuse that spirit into their teachings, whether in the colleges themselves or in the public schools.

Cornell has, in the last report of its regents, given a very striking exemplification in the latter direction, showing among its graduates not fewer than twenty-nine men who have gone out as teachers of agricultural science in the several colleges, and most of whom have made their names well known to and appreciated by the farmers of the United States. It is a striking example of the little leaven that leaveneth the whole mass, and has done vastly more to promote agricultural progress than ten times the number of "farm school" pupils could have done.

But while nothing short of the broadest culture is desirable for the graduates of the agricultural colleges, whatever may be the opportunities afforded by them to those not aspiring to future leadership, what shall be done for the rank and file of the farming population—the millions who can not go to college, or, in fact, to anything beyond the public schools?

The problem is a formidable one. But while various methods may be suggested by which the public schools might be made more satisfactory in respect to the education specially needed by farmers in this country, there can be no question that a change in that direction is pressingly called for. In fact, I contend that the dissatisfaction expressed by farmers with respect to the agricultural colleges should much more appropriately be directed against the public schools. It is there, next to the farm itself, that the bias unfavorable to the pursuit of farming is formed and confirmed, long before the young man reaches the agricultural college. The latter is too often called upon to undo what parents and teachers have done (or more generally left undone) at the critical time when the mind of the young is most impressionable, and when the taste or distate for manual labor, and the habit of using the senses to the best advantage, are either formed and confirmed or else left to fall into disuse. The fact is, and we may as well face

it squarely, that these desirable tastes and habits are by far most readily and lastingly formed in young, and even very young, children, and that not only is the boy father to the man, but the very baby is father to the boy himself.

It is hardly necessary at this late period, and before this audience, to go into all the arguments and proofs in the premises. The kindergarten is coming to be more and more an established fact, and with it the conviction that the time when manual and sense training should be begun is almost from birth. The natural and most precious time for inculcating the taste for and habit of the use of the senses, and with it that love of work that leaves the possessor unhappy when compelled to be idle, *lies within the limits of boyhood and girlhood,* and that *chiefly in their earlier portions.* No colleges, no matter how organized, can ever make up for the omissions made in these early portions of the child's life; and it is glaringly unjust to make them responsible for the consequences of such omissions.

The kindergarten first, or its equivalent in home training, as an indefeasible part of primary education, and then the continuation of the same system in the constant exercise of the senses and perceptive faculties in manual training schools, forming part of all public schools, high or low—that is, in my view, the true and only remedy for the evils complained of, not only by farmers, but, also, in a large measure, by society at large. There can be no question of the fact that the time-honored system of education, from lowest to highest, neglecting this sense training, is largely to blame for the numerous cases in which men and women completely miss their life vocation; simply because they have never been brought face to face with what they were truly fitted for. It is difficult to estimate the number of bad poets, penny-a-liners, lawyers, doctors and other professional men who would have graced the carpenter's bench, the machine-shop, or the farm, if they had only been made aware early in life of their capacities in these directions. I believe that to every sane man and woman is given the faculty of doing something well, and with enjoyment thereof; and that if the parents and teachers are only on the alert, and give each child the freest opportunity to find his life work among what is offered in the home and school, few will fail to succeed. But if both in the home and school only the meager outlook of ill-rewarded drudgery on the one hand, and of the mysteries of the "three R's" on the other, is held up to view, what wonder is it that the child, seeking something that will interest and please him, will but too commonly seek and find it in wrong-doing, in listless apathy, and later in flight from the farm?

It is surely, then, by *broadening,* and not by *narrowing,* the education of farmers' children, from the primary school to the college, that the ills complained of can be remedied. Speaking for the child on the farm as emphatically as for the student at the agricultural college, I contend that parents have no right to predestine him for the pursuit of the same path trodden by themselves. But I feel fully assured that by the broadening of the child's view through the training of his perceptive faculties, and not only of conscious reasoning as is now done, the greater attractions of the farm, intelli-

gently viewed, would keep the vast majority just where their farmer parents want them; and for those that are not thus kept, it is plain that another path would be preferable to life-long dissatisfaction with their daily work.

In other words, I do not think that farm life and the farmers' pursuit, intelligently viewed, stand in any need of being bolstered up by the haziness of an agricultural atmosphere, and by holding the boys down to uneducational manual labor, just to keep up the habit, as its advocates say. Intelligent parents and teachers can readily render them so attractive that only those whose natural aptitude leads them to other pursuits will be anxious to abandon them. But this can only be done if the precious time when the child's five senses are open and eager for such impressions is properly utilized, and if sense training be made part and parcel of school education of all grades.

It is, however, far from easy to bring about this state of affairs, and sweeping legislative enactments in that behalf would be powerless to do so. Teaching requires teachers. and the teachers competent to carry this idea into effect are as yet few and far between; and a large proportion of those now teaching would prefer to continue in the old routine, which they have thoroughly memorized, and which costs comparatively little mental effort. In justice to teachers generally, it should be said that the rewards attendant upon the performance of their all-important duties are by far too small to induce them to qualify themselves thoroughly and make teaching a life pursuit. Under these conditions a very large proportion take up teaching simply as a temporary shift, until something better turns up; and thus the tendency is to go no further in qualifying themselves than is just sufficient to pass examinations. Such half-hearted teachers can not be expected to feel enthusiastic about the introduction of improvements that, in order to be effective, require a strong effort and single-minded devotion to the task.

It should be fully understood that an improvement in the results of education, such as is so strongly desired by farmers in particular, means increased qualifications and efforts on the part of teachers, and, therefore, increased expense, not only in respect to salaries, but, also, as regards the needful appliances. The best qualified teachers, however, will, as a rule, require the smallest amount of such appliances, and will be able to make the ordinary surroundings of a well-kept school-house supply, in a large measure, the place of a multitude of costly apparatus. The more this is done, the more impressive will be the teaching; for nothing makes the scholar realize so fully the meaning and import of instruction as the bringing home of it to every-day life.

But it is useless to expect important improvements where country school boards turn over the incalculably important task of molding the children's minds and tastes for life to the lowest bidder who can make some kind of a showing. And it must be specially remembered that teaching is itself an art, independently of its subject; and that men or women who may be excellent workmen in certain lines may utterly fail in imparting their

knowledge to the young. This is a most essential consideration, in view of the fact that it has often been suggested that in country schools the neighborhood carpenter or blacksmith should be called in to give instruction in their trades to the school children. As a rule, such arrangements will utterly fail, and only prove a weariness to the children, for the ordinary artisan will use no other methods than those he applies to his apprentices, namely: to let the learner absorb what he can by looking on, or by doing the things himself. This mode of learning is extremely tedious, and, as a rule, a comparison of results achieved, and of the time employed, will be far from satisfactory. As a matter of fact, the teaching of any particular trade is not, and can not be, the object of the common schools, for the subjects would be too numerous and the appliances needed far too costly. What the schools should and can do is to teach each child to *make use of his senses and faculties conjointly*; after that, instruction in special trades must be left either to individual effort or to special trade schools. If it were attempted to impose the learning of any particular trade upon all the children of any school, the inevitable result would be a general rebellion against that trade, and probably it would be the most unpopular of all the life-pursuits chosen by the scholars.

This brings up the subject of the so-called "farm schools" about which so much has been said, as though they would be the supreme remedy for the exodus of farmers' boys to the cities. As understood in Europe, "farm schools" are establishments where boys are taught simply the handicraft of farming, with few or no principles, but substantially only rule-of-thumb. They are intended for the sons of peasants who desire to learn an improved practice, after having gone no further than the common school, in which, moreover, the training of the senses has been pretty much left out. The boys, therefore, learn by absorption what will be the best practice for them in their particular neighborhood. As the boys are predestined to be peasants themselves, no effort is made to give them a glimpse of anything else. It would be useless to them.

But I do not believe that our farmers, as a body, want that kind of instruction for their sons, even for the sake of making them farmers. Not only the American boy himself, but the boy's parents, very soon revolt against any such machine work, as has been amply shown in the case of the agricultural colleges that were at first established upon the farm school idea, and in the main gave the boy a bare grammar school education while making him work for his living most of his time. The idea took like wild-fire at first, and like wild-fire it soon burned out. These very same institutions have, step by step, been compelled, not by the old school educators, but by the demand of parents and pupils, to throw out of their course all uninstructive labor, and to enlarge the scope of instruction, until the subjects taught differ but little in kind from those in the courses of other, non-agricultural, institutions. Albeit, they remain differently proportioned, and very properly so. But the dense agricultural atmosphere at first created around

the pupil has been cleared away, and he is made to feel that, although a farmer's son and intending to be a farmer, he is a free agent, and a member of a progressive community in which class distinctions are, if not unknown, at least reduced to a minimum.

I will not discuss at length the question of the usefulness of the college farm in making practical farmers of the students. It is now pretty well admitted that, whether carried on on the "model" or on the "experimental" plan, it can not very well make practical farmers of the pupils. The actual management of farms is best learned on well managed farms run for profit, which the college farm can not be if utilized for instruction. So far I agree with those who deride the idea of farming being taught in colleges. In my view, the college farm should serve precisely the same purpose that laboratories do in other lines of technical study—for illustration and demonstration of principles, and to teach actual manipulation in connection with such principles; and just as a "practical course" is required of any student in other occupations before he is considered competent to practice, so must every agricultural student expect to make his practical apprenticeship on a farm. But the difference will be that, while a raw boy will, as a rule, require years to learn the mere routine of operations, without the ability to adapt himself to varying conditions, the boy who has gone through a proper course of instruction will qualify himself in the course of a few months, because trained to observation and reasoning, and to an understanding of the underlying principles. In fact, the American boy is so prompt in acquiring manual dexterity that the "rubbing in" method is quite out of place where he is interested, and knows what is to be done, and why. It is, at the very least, unnecessary to stint him in his education by the time devoted to merely mechanical drill. Teach him to use his senses, and give him a knowledge of the principles upon which he is to work, and he will generally take care of the rest himself.

On motion of Mr. Munson, of Texas, a hearty vote of thanks was extended to Prof. Hilgard for his excellent paper.

Dr. White, of Santa Rosa, renewed the invitation from citizens of that city to visit them, which was accepted.

Major Lauck, of the Southern Pacific Railway Company, stated that the contemplated excursion train to the Napa and Sacramento valleys, consisting of four Pullman cars, would leave San Francisco on Tuesday next at 7:30 A. M., giving the delegates an opportunity to visit and stop at Vallejo, Napa, St. Helena, Sacramento, Marysville, Oroville, Chico, Vina, Redding, Red Bluff, Woodland, and return to San Francisco on Thursday evening. All members and their eastern friends would be the guests of the railroad company during the trip.

On motion, all necessary arrangements for the Santa Rosa excursion were referred to a committee consisting of Dr. Ridpath, of Indiana, Treasurer Evans, of Missouri, and Major Lauck, of California.

A committee, consisting of Mr. Hubbard, of New York, Mr. Goodman, of Missouri, and Mr. Van Deman, of Washington, was directed to make all necessary arrangements for the Riverside excursion.

Vice-President Munson, from the Committee on Resolutions, presented the following

FINAL RESOLUTIONS:

WHEREAS, The American Horticultural Society, and all the individual members, have been so hospitably received and entertained by the city and citizens of San José during the session of this convention, therefore,

Resolved, That our sincere and hearty thanks are tendered to them for their generous attention during our stay among them.

Resolved, Also, that our thanks are due to the papers of this city and San Francisco, to the *American Garden* and others, for sending competent reporters among us for the purpose of more thoroughly sending abroad a report of our proceedings to the world.

Resolved, That for the faithful manner in which the reporters have done their work we are very grateful.

Resolved, That our further thanks are due the Southern Pacific Railway for reduced excursion rates to this city and return.

Resolved, That our profound gratitude is due, and hereby tendered, the Board of Trade of San José for providing this excellent place in which to hold our session.

Resolved, That our thanks are especially extended to the ladies of San José who have so royally provided for our comfort and entertainment while sojourning in this city.

Resolved, That we further sincerely thank the citizens of San José for taking so great an interest in the increase and acquirement of a large membership in California, and San José in particular.

T. V. MUNSON,
J. M. SMITH,
JOHN C. RIDPATH.

The resolutions were adopted by a rising vote.

The Society then adjourned to re-assemble in Riverside on Tuesday, February 7.

THE BANQUET AT TURNVEREIN HALL.

Reference has already been made to the pending banquet to be given the Society on Thursday evening by the ladies of San José, and, also, to which Dr. Ridpath, in his accompanying sketch*, will refer to in detail; yet, at the risk of repetition, the Secretary will venture to here allude to some of the features of this recherché affair, which seem to call for special notice. A brief quotation from the San José Weekly *Times*, of January 28, is beautifully descriptive of the cards of invitation, which, no doubt, will be preserved by every guest as souvenirs of this pleasant occasion:

The invitations issued were intended as souvenirs of the convention as well as passports to the banquet. They are very handsome, all the printing being done in gold. On the front cover is "Welcome to Our Nation's Horticulturists. San José, California, January 27th, 1888." On the back is represented a basket filled with golden fruit. The names of the Committee of Management are given on the third page, as follows: Mrs. L. J. Watkins, Captain J. H. Barbour, Mrs. S. W. Boring, Mrs. E. O. Smith, Captain W. T. Adel. The second page of the invitation is adorned with the following poem, written by one of San José's most talented ladies:

A CALIFORNIA YEAR.

BY MRS. M. H. FIELD.

How do we know when the spring has come,
  In this pleasant land by the western sea?
Why, the rainy days grow farther apart,
  And the clouds before the north wind flee;
The gardens are blue with forget-me-nots,
  And pepper trees scatter their berries red;
The hills with poppies are all aflame,
  And linnets and meadow-larks sing o'erhead.

How do we know when summer is here?
  The sky is one vast, deep vault of blue,
Whence the sun pours down his golden flood
  Unchecked by a cloud the long day through.
Grain fields are waving, and orchards bend low,
  Roses and jasmines hold riotous sway,
While tents are unfolding on mountain and shore,
  And the life of the campers is blithe and gay.

*See Appendix.

What is the sign of the autumn-time?
  Oh! then the vineyards their splendor show—
Muscats and Hamburgs and flaming Tokays—
  Never were clusters like these, I trow.
But the roadside trees with dust are gray;
  Yellow and sere lie the hills and the plain;
The water-courses are parched and dry;
  All patiently wait for the beautiful rain.

But the winter—ah! that is the strangest of all!
  Instead of the north, the south wind blows,
The sweet south wind that brings the rain,
  The pattering rain, not wintry snows.
And then the rivulets sing once more,
  The hills turn green, and the dear wild flowers
Awake from their sleep, while the furrowed earth
  Grows young again 'neath the welcome showers.

Never were honored guests entertained in a more hospitable and happy manner than were the visiting horticulturists and their friends. One word will describe the banquet better than a column of adjectives: it was perfect. Nothing short of that would be just to the talented ladies who so quietly and gracefully achieved such success. Their triumph was complete, and well fitted to close the harmonious meeting of the Society.

Of the many toasts and responses, but one would seem appropriate in this connection, viz.: "Horticulture, Practical and Theoretical," responded to by Dr. Ridpath, of Indiana, as follows:

To study much a fact called chemistry,
  To learn earths, acids, alkalies and all,
To know all seeds and name all bugs you see,
  Is *Horticulure Theoretical.*

To reason long about the laws of things,
  To make analysis, to classify
All leaves, legs, bodies, bugs, scales, teeth, toes, wings,
  And give them titles that may pass for aye;

To talk for weeks how much of this and that
  Is necessary that a plant may grow,
What rainfall, dewfall, sun, wind, cloud are pat,
  And then tell others what you do not know;

To raise within a busy cranium
  At least six crops before you plant at all;
To write long letters and for papers some,
  Is *Horticulture Theoretical.*

To feel the sunshine and the morning dew,
  To smell the ground in the first days of spring,
To have for company yourself and you,
  To hear the robins and the bluebirds sing—

To hoe and harow, and to put plain dirt
  On living seeds, and then to wait awhile;
To be afield in democratic shirt
  And use your muscles in plebeian style—

To take all nature in your hardened hands,
  Plant trees and vines, train, prune, protect and pluck,
Believe in self and in your fertile lands,
  And have more faith in living than in luck—

And then, at last, to sit in glorious style
  'Mid golden fruits heaped high in royal state,
Offered by beauty with a gracious smile,
  To strangers dwelling in the city gate—

To taste, to eat, to feel the throb of pride,
  To rise rejoicing from the festival;
To clasp new friends with old ones by your side,
  Why—that is *Horticulture Practical.*

ADDITIONAL PAPERS.

The Secretary will here add such papers of merit as were, for the want of time, referred for publication without reading. Two of these are really reports from important standing committees, and all are highly meritorious.

REPORT OF THE COMMITTEE ON NOMENCLATURE.

SOUTH HAVEN, MICH., January 5, 1888.

To Hon. Parker Earle, President of the American Horticultural Society:

The undersigned, chairman of the Committee on Nomenclature, would respectfully report that contributions to such report have been received from only two members of the committee.

Mr. G. B. Brackett, of Iowa, says: "I most heartily indorse the idea you have heretofore advanced, and urged upon the various horticultural societies, in reference to shortening and correcting the names of the fruits in our catalogues; and we should also endeavor to convey as much information concerning the variety as possible, consistently with brevity, in the naming of new fruits, and avoiding all Latin names which may be liable to convey the idea of a distinct species, such, for instance, as *Prunus Simoni* or *P. Pissardi.*

"There is another point to which I wish to invite attention, and which you can enlarge upon, as it is a source of great confusion in the nomenclature of our fruits, viz.: The introduction of old varieties under new names. This can only be done among a class who are not familiar with fruits; and, perhaps, this is practiced to a greater extent in our state (Iowa) than in yours (Michigan), for the reason that there is a mania for something new since our old varieties began to fail; and there is a set of mountebanks who are ready to take advantage of this 'tidal wave,' and furnish the eager seeker after something new with these old sorts with newly-made names. A case in point was brought to notice at the late meeting of the American Pomological Society, where it was stated that the Lawver apple was being disseminated in New Jersey and Delaware under the name of Delaware Winter. Many such instances have occurred in Iowa. This is one of the ways in which synonyms are multiplied."

On December 31, the following was received from T. V. Munson, of Denison, Texas: "I had hoped to send you something worthy of attention ere this, but after attempting to review our fruits, I became so confounded with the matter that I gave up in despair of ever getting our names adopted, even if we should succeed in simplifying them. I have, therefore, come to the following conclusions:

"1. That the revision of the nomenclature of fruits is a special and appropriate work of the American Pomological Society, which it has so well begun.

"2. That about all our American Horticultural Society can do is to second that work by adopting the Pomological Society's revisions and suggestions, and by urging upon all our members the observance of the rules of nomenclature of the American Pomological Society, and especially by urging nurserymen to make their catalogues as correct as possible in nomenclature; thus correctly educating their patrons.

"3. That in other branches of horticulture we urge a similar reform; that is, among seedsmen and gardeners, that they reform their names, dispense with the numerous synonyms, and abbreviate consistently.

"4. That we recommend to the Department of Agriculture to confer with the committees on nomenclature of the various societies, and, with their aid, prepare a set of works describing accurately each distinct and well-known variety of fruit, grain, vegetable, grass and flower, with the leading name, as the authoritative one, and synonyms following, so that old varieties under new names could be easily traced to their true position and correct name, upon some system of arrangement similar to that of Downing's 'Fruits and Fruit Trees of America.'

"5. That the department keep the work up to the times by supplements and revisions, since the publication of such a work truly belongs to the general government, as no individual can afford to do it, such works being in demand by so few that they yield the publisher no profits, and yet, as standards for reference, they are highly important, aiding greatly in the prevention of fraud by dishonest dealers in selling old varieties under new names.

"6. Such works should be kept in constant and sufficient supply by the department, for distribution at cost, to meet all demands.

"7. Committees on nomenclature should secure the correct names and descriptions of all new varieties, and report the same to their respective societies, and, through them, to the Department of Agriculture."

Being fully in sympathy with the foregoing suggestions of my associates, I may indulge in a few remarks respecting the objects sought and the difficulties in the way of their accomplishment.

Aside from the enactment of the requisite rules for the control of nomenclature, doubtless the most effective means of advancing the desired object in this, as in most similar matters, is to insist, even pertinaciously, upon adherence to such rules in the discussion of varieties during the sessions of the Society, and to adhere rigidly to their application in its published transactions. If, in addition to this, nurserymen, and writers upon the subject, can be induced to apply such rules in their catalogues and other publications, the object may be assumed to be practically accomplished. It may properly be added that a society is doubtless better with no rules whatever than, having them, omit their enforcement.

The American Pomological Society is devoted exclusively to the work indicated by its title, while the American Horticultural Society ostensibly covers the entire field of horticulture, which, in the modern sense of that word, also includes pomology; to which, in fact, its labors so far have been largely devoted. Since the truth is obvious, therefore, that these two independent organizations can not otherwise work effectively to the end suggested in Mr. Munson's first and second propositions, it would seem necessary, if the information accumulated by each is to be utilized, that there be not only an understanding effected between these

societies, but that there also be a standing conference committee between them, to which matters of the character referred to shall be submitted, and by them reported to the society in whose transactions their matured conclusions are to appear.

The carrying out of Mr. Munson's third suggestion is a work which the Society, in its title, has clearly assumed; while this field calls for effective labor quite as forcibly as does that of pomology. This field, moreover, is, as yet, almost wholly unoccupied so far as reform in nomenclature is concerned; and yet, even here, there would doubtless be found, as in the case of pomology, occasion for concert of action between this Society and the associations of the florists, the nurserymen and those interested in forestry.

It is, however, especially to the broader, and hence more important, suggestions contained in the remaining clauses of Mr. Munson's portion of this report, taken in connection with the points mentioned by Mr. Brackett, that I desire to invite the thoughtful consideration of the Society.

For the first time since the organization of a national Department of Agriculture, it has at its head a person possessing an adequate conception of the needs, the present importance and the possibilities of American horticulture. This is clearly evinced by the steps already taken by the department to assist in developing the various interests associated under this head, notwithstanding the limited appropriations available for such purpose.

It seems difficult to conceive a more effective mode of extending public aid to individual enterprise of the character indicated than by the process shadowed forth in Mr. Munson's fourth proposition: that all societies, whether national or local, either directly or indirectly, place themselves in correspondence with the appropriate branch of the department, reporting to it the origin, names and descriptions of all new fruits, together with such other valuable information as may come within their knowledge; such varieties to be examined, and, if found worthy, to be described and duly entered upon the department lists and the same published, with date and place of origin, the locations in which it has proved successful, and the purposes to which it is adapted. A publication of this character for each of the principal departments of horticulture, including the valuable varieties already known and in cultivation, with accompanying synonyms, and supplemented annually by lists of the meritorious novelties of the past year, approved by the societies and by the department, and resolutely excluding unworthy varieties, would, doubtless, soon come to be generally recognized as authority as to the value of varieties, and hence become the means of suppressing the mass of trash which, in the hands of unscrupulous persons, has so long, so heavily, and to so little purpose, taxed the ignorant and the unwary.

Such a check upon the introduction of worthless novelties has been long needed, especially in pomology, since the multiplication of varieties has long been such that even the publishing of short and hence imperfect descriptions, as a means of identification and detection of re-introductions under new names, is already quite beyond the capacity of individual enterprise, and, in consequence, standard works of this character are already, in too many cases, comparatively stale and useless, while the need of such has become increasingly great.

All of which is respectfully submitted, T. T. LYON, *Chairman.*

SOUTH HAVEN, MICH., January 9, 1888.

Since the preparation and forwarding of the report of the Committee on Nomenclature I have received the following from Edmund H. Hart, Federal Point, Florida:

"There is little to contribute in the matter of nomenclature from this state.

"In the Nurserymen's Convention at Palatka last July it was decided that the *Ereobothrya Japonica*, generally and erroneously called Japan plum, be in future designated by its proper name—Loquat.

An imported and anonymous citron exhibited by Rev. Lyman Phelps, said to be valuable for preserving and palatable in a fresh state, was named the Lyman citron.

A motion was made to call *Diospyros Kaki*, Kaki, instead of Japan persimmon; but it was not adopted, after the objection made that, being an undeniable persimmon, and of Japanese origin, it is really entitled to its present name. The nomenclature of this is, however, so barbarous and so inextricably confused that a sweeping revision is loudly called for, and will probably be attempted soon.

(Signed), EDMUND H. HART.

W. H. Ragan, Secretary American Horticultural Society:

Please add the foregoing to the report of the Committee on Nomenclature recently sent you. Very respectfully, T. T. LYON,

Chairman Committee on Nomenclature.

REPORT ON EXPERIMENT STATIONS.

BY HERBERT MYRICK, OF MASSACHUSETTS.

I am asked to contribute a word in relation to experiment stations. This subject becomes of enormous consequence by reason of the passage of the Hatch experiment station act, under which an appropriation of $15,000 annually is expected for each state, to be devoted to conducting an agricultural experiment station in connection with the agricultural college. This act says that the appropriation shall be made annually. It is not a perpetual appropriation; congress must provide for it every year. This has been pointed out as a great weakness in the law, but to my mind it is one of its strongest points. The stations established under the Hatch act must attend strictly to business, and do the work that the farmers want done, or they will not satisfy the public demand, and the result will be that congress will withdraw the appropriation.

But let the stations do good work, and the work that is most needed, and there will be no doubt that the necessary funds will be forthcoming without fail every year. Thus the stations will be put on their mettle, and the abuses and errors which have grown up in some states by the administration of the agricultural college act of 1862 will be avoided. The $15,000 annually to each state will not be permitted to be gobbled up by any third-rate literary institution, which may have been successful in gulping down

the whole or a portion of the income due to its state under the land grant act of 1862.

There are several conceptions as to the work which experiment stations should do in this country. The director of an institution of this nature, which has received large grants of money, but has yet produced but meager results, said, when asked why he did not issue bulletins of information upon those subjects:

"You say I ought to send out bulletins describing and illustrating the Hessian fly, and what can be done to prevent its ravages. Now, it is true that such a bulletin would be of interest to farmers at this season [which was in the midst of an attack of the fly], but what would my scientific friends, the directors of other stations, think to receive such a bulletin of well-known facts?"

We replied that it made no difference what the directors of other stations thought. The station in his state was for the benefit of the farmers in that state. While it should do original and careful scientific work, it should also be ever ready to give the information that farmers want. At that time the best possible service it could have done would have been to issue as a bulletin a complete illustrated history of the insect that was ravaging the wheat crop, and what measures could be taken to prevent it, or what measures the farmers might pursue to guard against its return in the future.

To my mind work of this nature is the first duty of each and every experiment station. It should be a bureau of information, where, upon application and without cost, the farmers of the state could secure full knowledge so far as it was obtainable upon any point involved in their business. Indeed, an experiment station that thus gets down to the common, every-day, working farmer, should have so much correspondence of this nature as to require the constant employment of at least one, if not two, competent stenographer and type-writer. Every effort should be made to encourage farmers to ask questions of the station, and also to visit it. They should be made to know that it is established and operated for their benefit. Copies of letters and replies of general or special interest should be sent to all the agricultural papers that circulate in the state, as well as the party whose inquiry provoked the answer. Indeed, no effort should be spared to place the information given out by the station before the whole public of farmers.

One of the best features of the Hatch act is that which permits the free circulation in the mails of the experiment station bulletins and reports. There would be no sense in spending $15,000 or more annually in each state in work of this nature, ostensibly for the benefit of farmers, and then have it locked up in an annual report that few would ever see. It is the diffusion of knowledge that should be one of the important objects of the station, and this should apply not only to the results of the the station's original work, but to the diffusion of results and knowledge gained at similar institutions elsewhere, or knowledge gained by any other means, so far as it applied to, and was helpful to, agriculture. Under a proper system of management this

diffusion of information need not seriously interfere with the scientific and original work and experiments of the station. A proper executive management will distribute the inquiries and requests for information on various points in such a manner among the employes of the station, that the work shall be so divided as not to seriously draw them away from their actual work in carrying on experiments in the laboratory, stable or field.

This is merely a fragmentary suggestion in relation to this most important and far-reaching subject. Nevertheless, I believe it is exceedingly important, and if I were to emphasize any one point above all others, it would be this: The experiment station should get down to the common farmers, who most need their help, by direct correspondence, by bulletins, by annual or more frequent reports, and, above all, through the press. This is said with the understanding, of course, that the dissemination of partial results or misleading experiments is to be guarded against. It is also understood that, in all these presentations of knowledge to the people, the facts are to be stated in plain language, that the average farmer can fully understand. Short sentences and clear definitions are required. Brevity is above all things to be desired. But references may well be given showing where further details may be found.

HOW TO GET A RACE OF HARDY FRUITS FOR THE NORTHWEST.

BY C. L. WATROUS, OF IOWA.

There is, perhaps, no other question whose prompt and practical solution would bring more daily comfort into the home-lives of the people of the prairie region of this continent. Of food and shelter we have abundance. It is a light task to build against the wildest blasts, while barn and yard and field are annually overflowing with fowl and flesh and grain for the sustenance of a vigorous race of men. But more and more is fruit becoming a large and necessary part of the daily food of the highly organized and nervous race occupying this region. Races whose vital and mental activities remain nearest the animal may thrive on meat and bread, but the highest living and highest thinking are nourished and stimulated by the finest fruits of the temperate regions.

The rich, cool acid of fruits more truly deserves to be called *Elixir vitæ* than any fancied distillation of alchemists, and of all fruits the apple is undisputed king. But now over all the prairies rides the black-visaged herald, proclaiming with blast of trumpet and solemn voice, "The king is dead! The king is dead!" And as he rides, lo! other heralds cry aloud, "Long live the king! The king lives!" And they tell the people how to have sound and healthy orchards. Some say, "Here be trees crown-grafted on whole roots, let them rule over you. The price is high, but they are worth it." Others announce, "Here be trees budded on seedling stocks; they are worthy to rule over you, at no matter what price."

Here also ride other evangelists—stern-visaged men, weak in numbers but strong of purpose—filling all the air and the newspapers with loud acclaim, "Here come the Russians! Make way for the noble Russians! They, and they only, are able to live and rule in the land. They are crude and wild, but they are vigorous and hardy. The imperial purple costs money, but it is our only refuge. Buy and plant and have faith!"

Thus exhorted, men are planting again, slowly. Perhaps anything is better than nothing, and all these proclaiming evangelists may find mercy hereafter through that consideration. Prudent men know all these for tinsel kings, and look into each others eyes for an answer to our first question: How shall we get a hardy race of fruits fit to rule our tables and our cellars?

Experience teaches that crown-grafts on whole roots are a delusive remedy; that with a short piece of root, a long scion of a hardy variety soon forms a tree substantially on its own roots—the best form of a root-grafted tree; and that the best sorts budded on seedling stocks are less reliable than any sort of root grafted tree. Clearly, no known method of propagating the varieties we have gives promise of full relief.

Facing the evangelists of the new gospel of the Russians, we cry in despair: "Show us your divine right of kingship and we will bow in submission." Comes the answer: "Russia is a land far northward, with a climate more severe than ours and a similar soil; therefore, trees hardy there will be still more hardy here. Moreover, many of them are winter apples, which may be depended upon to be reliable winter-keepers as far south as latitude 41°." It is admitted that the home of the Russian apple is beyond north latitude 51°, from 600 to 1,000 miles north of central Iowa, and should be reasonably expected to mature unseasonably in a much longer season. But the Russians say the influence of the Atlantic gulf stream carries the line of equal summer heat 10° farther south in Europe than in America, therefore, 10° farther south in America will equalize conditions, and Russian apples, winter-keepers in latitude 52° there, will keep equally well grown in latitude 42° here. How two climates can consistently be claimed as similar, while in one the moist and warm influences of the gulf stream are potent enough to change the isothermal line through ten degrees of latitude, and are absent from the other, no man has yet risen to explain. Central Russia is far from the sea, but no elevations of land rise between them, while western America has range upon range towering heaven high, so that the soft influences of the Pacific are scarcely felt beyond a few miles inland.

The foremost authority in geographical botany, Griesbach, divides the earth into twenty-four botanical regions. A map of these regions shows the green shade of the north Europe and Asiatic timber region as extending from the shores of the Baltic fully five hundred miles beyond Moscow, Orel, Veronesh and Bogdanoff, where, we are told, is the home of the most promising Russians. Our own Asa Gray, after a journey of observations, used these words: "I have been able to see for myself what species and what forms constitute the main features of the vegetation of each region, and

record, as the vegetation unerringly does, the permanent characteristics of its climate." The climates of western Europe and western America are duplicates, while corresponding eastern shores bear like relations.

Asa Gray tells us that about latitude 47° the trees of the Pacific extend eastward and mingle with their cousins of the Atlantic, while at 37° there is a broad hiatus of a thousand miles between the two floras. The trees of the Pacific and of western Europe generally fail before maturity, even if successful through infancy on the prairies. Whether the trees of Russia will in the end fare much better appears more doubtful every year.

Secretary A. C. Hammond, of the Illinois Horticultural Society, says in his last report: "I have tested many of the Russians. They do well until they come into bearing, when they almost invariably blight and die. Even if the trees grow the fruit is too poor to be of much value. South of latitude 42° they are not wanted." Prominent horticulturists in Ohio and Missouri have lately expressed themselves to much the same effect.

Thus far the most successful Russian orchard in America is in the timbered region of southern Wisconsin. The prairies have never shown such success. But this is no new experiment, it is only an old one revived.

More than forty years ago President Berckmans, of the American Pomological Society, tested, with his father, in Belgium, about 500 varieties of South Russian and Hungarian apples. In 1845 the most promising of these were brought to America. President Berckmans now writes that none of them proved good keepers, and, so far as he knows, the race has entirely disappeared from the region of the experiment.

In 1852 or 1853, scions of many of these were sent to Ellwanger & Barry, at Rochester, N. Y. They now say that after more than thirty years of trials and importations from the best known sources, they have abandoned all hopes of finding good quality or good keepers, or, indeed, of finding any sorts worth cultivating anywhere, unless they will succeed where others fail. No reliable winter-keepers have thus far been found among the late importation in Iowa, nor any of high quality.

Many scores have been shown in August and September, but, with few exceptions, the flavor of the Cossack hangs round them all. No rivals of such apples as Early Joe, Benoni, Dyer, Porter and many others have been shown, while of a score out of our noble old list of winter-keepers, it must be confessed there is absolutely none among all the Russians to fill their places. While many Russian apples have succeeded fairly well in nurseries where our oldest sorts have lately been crippled, yet the most promising of them have shown in nurseries from Minnesota to Missouri, among other weaknesses, a strange infirmity in respect to the needful nursery pruning at the age of two or three years, turning black at the cut, whether made early or late in the season. For this reason one of the most extensive growers of Russians in Iowa has lately suggested the possible advisability of growing Russians without nursery pruning.

As has been pointed out by more than one, this inability to endure

pruning shows a fatal lack of adaptability, if not a lack of hardiness. Here let it be noted, the use of the word "hardiness" instead of "adaptability" has led to great confusion of thought. A tree native in a colder climate may naturally be supposed hardier if we mean by this better able to endure excessive cold. But for that very reason it is likely to prove unadapted to a hotter or a dryer climate, for excessive summer heat is as fatal as excessive winter cold.

It is the unlikeness of conditions that causes the plants of one clime to fail in a different one, and God has not made any two distant regions alike, as was so forcibly pointed out by the great Humboldt near a century ago. History shows no instance of successful acclimatizing on a large scale except by nature's method of variation by seedling productions to meet changed conditions. No man is better qualified to speak on this subject than Charles Darwin. Of the relations between the plants of Europe and America, he says: "On this view we can understand the relationship with very little identity between the productions of North America and Europe—a relationship which is highly remarkable, considering the distance of the two areas and their seperation by the whole Atlantic ocean." And again: "When we compare the now living productions of the new and the old worlds, we find very few identical species, but we find in every great class many forms which some naturalists rank as geographical races, and others as distinct species, and a host of allied or representative forms which are ranked by all naturalists as specifically distinct."

It is not necessary to heap up evidence, of which all modern botanical science is full on this and cognate points pertinent to our inquiry. Darwin has shown conclusively that crosses are stronger than self-fertilized plants, but our nursery methods of propagation by buds are, in their results, the very essence of in and in breeding a species of incest repugnant on physiological grounds to all laws human and divine.

Darwin and others have also pointed out how in nature new and improved species, better able to withstand new difficulties, have continually crowded to the wall older ones. Says Professor Gray: "A series of plants propagated by bud only must have a weaker hold of life than a series produced by seed. How and why the union of two organisms, or generally of two very minute portions of them, should re-enforce vitality, we do not know, but this must be the meaning of sexual reproduction." Mark well the words, "re-enforce vitality—by the the use of two organisms," for right there, unless I greatly mistake, is the seminal idea—the key that in worthy hands will unlock the castle of all our difficulties.

For two generations the nurserymen of America have neglected the vital process of natural propagation. Now, like many another prodigal, having exhausted the patrimony gathered by the fathers, they are unhappy. An inspection of Downing or Warder will reveal the principal origin of our noblest apples as chance seedlings in the older settled states, in the primitive days when millions of seedlings grew to maturity among the hills.

The road to a race of hardy fruits for the northwest is not paved, and it may be long, but all botanical and biological science points in but one direction. Where shall we begin the advance? What races and varieties offer most promise of speedy relief.

DeCandolle tells us that our own apples probably originated somewhere in the region between Trebizond or Ghilan, in north Persia, south of the Caspian sea, and that its prehistoric area extended thence nearly to Europe.

He adds: "No author mentions it growing in Siberia or Mongolia, or in Japan." Hence all our Siberian and Russian apples must be regarded as descended, with variations, from this primitive form. President Berckmans says his Russian apples appeared by their names to have been carried to Russia from the countries of Germanic-speaking races. Mr. Barry noted the same thing among his importations, and a glance over any list of late Iowa importations betrays the same ear-marks.

Seedling reproduction in a severe climate may have produced modifications which will render them of extra value as breeders here. This will soon be known. The veteran Peter M. Gideon has produced, by crosses with the Siberian crab, some sorts that in Iowa nurseries now show a better adaptability than any of the Russians, showing less damage from climatic influences and less disease from needed pruning in nursery. These facts are visible and undisputed. They are vastly encouraging to the travelers in the new road.

Another most remarkable exhibit was made the other day at an Iowa horticultural gathering; nothing less than an apple nearly as large as the average Roman Stem crisp, juicy and well-flavored except in one respect. The tree that bore it was the lineal grandson of a wild crab from our thickets. It was a seedling from the Soulard crab, supposed to be crossed with a fine summer apple, and the original Adamic nature of the grandsire was too apparent. Yet it seemed to me, on the whole, more palatable than any Russian on the tables at the same time.

If all modern science be not at fault, if the doctrine of the survival of the fittest be not a delusion, these denizens of our own thickets, having been bred through all the ages to meet and endure the vicissitudes of prairie conditions, ought to be brought out and yoked to the car of civilization. DeCandolle says the lake dwellers of Savoy, Lombardy and Switzerland, before the use of metals, made great use of apples, drying them for winter provisions. They had two kinds, one somewhat less than an inch lengthwise, the other rather more, both being still a little larger cut across. From their abundance he thinks they may have been cultivated for food. These sizes do not exceed many of our wild crabs in a state of nature, which may be promptly enlarged by cultivation and abundant nutriment.

As to exact methods, thousands of men in the northwest are competent to place a graft of Russian, or Siberian, or native crab, or some well-adapted cross-bred descendant of them, in the top of a bearing tree, and repeat the process many times. When the graft fruits, there is a reasonable probability

of cross-bred seeds, which should be planted by tens and by hundreds and by thousands, and the work repeated again and again; for along that road lies the city of our refuge—a race of hardy apples adapted to the northwest. For the other fruits, except pears, the way is still easier. With plums the problem is already near solution. With cherries let us hope to see our own wild black cherries and our choke-cherries crossed and re-crossed with the European forms. Success lies at the end of the road. With grapes and all small fruits the problem is comparatively simple, and results much sooner reached.

In these pleasant fields are labors worthy the ambition of any man who loves his fellowmen and his native land. Does anyone ask what shall we do while the new race is breeding? I say plant the best old sorts where there is any hope of success. Top with the best winter sorts on hardy stocks and plant them. Plant Russians if they will succeed where others fail. Plant anything that promises fruit to eat till something better can be bred.

COMBINED AGRICULTURE AND HORTICULTURE.

BY PROF. GEORGE W. CURTIS, OF TEXAS.

This is an age of specialties—a time when close applied science is making itself heard in every quarter of the globe. The old time versatile genius vulgarly known as "Jack at all trades, master of none," has gradually been pushed farther and still farther back upon the shelf, while the dust of ages, started by the vigorous hand of spruce young "specialty," settles slowly o'er him. The time was—so the ancient mile-posts along the path of progress may tell you—when every man was a host in himself, and every good wife performed her simple duties of the household in addition to those regular tasks of spinning, weaving, fitting, and a score of other modern "specialties," each one of which involves at present millions of dollars capital, and is dignified or disgraced (we can not assume to decide) by the periodical strikes of some labor union machine. Some, perhaps, will mourn the passing of the "good old times," but to such we would say, not so, and, to change somewhat the old truism, "In union there is strength, in division, progress."

Life is too short and the world too large for a man to attempt everything. Let him, rather, devote what energy and patience he may have to the mastery of *one* thing—broad enough in itself to bring out the best with which nature has endowed him—and the world gains, while he losses nothing. Then, is it wise to advocate, as we presently shall do, the mixing of two such specialties as agriculture and horticulture? To this we answer, yes. Horticulture is only a branch of agriculture, so that no principle of the division of labor is strained. In fact, the exact boundary where the field of horticulture merges into its containing parent can never be located; the two are so intimately and firmly associated that a thorough knowledge of agriculture almost implies, and certainly demands, at least a primary knowledge of horticulture.

It is a fact which we need not argue that only in certain localities will horticulture *alone* be profitable. Where the soil is suitable, there must still be other conditions to render success probable, or even possible. There must be either a home market, as in location near a considerable city, or there must be cheap and speedy transportation. The products of horticultural labor are, for the most part, perishable, and must either go at once to the consumer or be put through a more or less expensive "process" for their safe preservation.

The nursery business is, to a certain extent, independent of these restrictions, and may very properly engross the entire time of the nurseryman. It should be borne in mind, however, that the supply must never exceed the demand if profit is the desideratum—and here hangs the key to the tomb of hundreds of dead nurseries. A good talker may often create a sort of unhealthy demand, but when the country has been flooded with nursery stock in this way for a year or two, no amount of talking can prevent the downfall of the nursery which caused the deluge. To be secure, a nursery must undertake only what its territory demands, and, further, it must not seek to extend that territory beyond the natural climatic and humidic limits of its own locality. Although, perhaps, foreign to the subject, it may not be out of place in this paper to decry the evil practice of selling nursery stock from one country in another of radically different temperature, soil and moisture. Such practices as this do much toward preventing, among farmers, a popular appreciation of the home orchard, and tends to foster feelings of distrust and resentment toward the entire nursery fraternity.

But while we may justly blame such horticultural knavery, we must also mention the lack of requisite knowledge to successfully plant and cultivate a fruit garden. Farmers, as a rule, have too little knowledge of the principles which underlie plain and practical farming, and when we add to this the care of orchard or vineyard, the majority are found sadly deficient. To remedy this defect is much easier than to control dishonest practice among vendors of trees; the latter we can only reach by proper legislation, the former we must seek to govern through educational channels. Our agricultural colleges are doing a grand work in this direction, and students who leave their halls are well-fitted to spread the knowledge which they have acquired among those who are not so fortunate. Nor is this all; there are men to be found who, at their own private expense, are doing much to instruct the unskilled in the growing of fruit and garden products. Horticultural meetings in all parts of the country are, in themselves, important factors in this horticultural education. The public press, by its faithful record of events and its tireless search after new facts and theories, has already done wonders. With future issues multiplied and scattered broadcast, so that even "he who runs may read," there is every reason to hope for rapid progress in this really important work.

In the cotton states there is an especial need for more admixture of horticulture and agriculture in farming operations. The cotton crop is

planted, tended and harvested at certain seasons, leaving the planter free at just the proper time for taking care of a small fruit garden, and giving him ample time as well to grow an abundance of fresh vegetables for home consumption. To remedy the evils which have eaten up the profits of cotton-growing in the past, it is necessary to economize labor by keeping it steadily employed. Why not, then, let us ask in all seriousness, why not encourage to the fullest extent the growing of fruit by southern farmers for home consumption. More than this, let the farmers once appreciate the benefits from such a course, and become familiar with the simple operations on which successful fruit-growing depends, and they will create a home market which must surely increase the yearly income. Canning and evaporating establishments are steadily increasing in number, and the great southwest is receiving her full quota.

Texas, with her one and a half million bales of cotton, representing an annual value of over $55,000,000, is slowly but surely turning to mixed farming for relief from the tyranny of "King Cotton," while fruit and viticulture are as surely pushing forward to a prominent place in the future operations of the farm. The peach, the pear and the grape find a congenial home on Texas soil, and there is no excuse for neglecting to profit by the cordial readiness of nature.

The system of farming in that great southwest area known as the "drouth region," has, heretofore, been too extensive to admit of costly methods of improvement. Soils, nowhere excelled for richness, have been classed as "grazing lands," for the simple reason that necessity had not yet forced upon our people the practice of close, intense farming, which demands a greater outlay while permitting the same percentage returns. Much of this so-called drouth area has an abundance of rainfall, but coming as it does during a few months only of the year, its effects are not lasting, and, indeed, a large portion of its bulk is rapidly carried away by ravines, creeks and rivers. If this body of water which is annually lost could be stored up and drawn upon as needed, we should have a section of country dotted with small, diversified farms, each one showing a considerable portion for fruit and garden use. "Will irrigation pay?" is a question often asked. We can only answer: Look around you at the places where irrigation *does* pay, and satisfy yourselves as to its value.

The great bugbear which has prevented a more general appreciation of the natural resources of the great plains, is the fear of investing capital which will not give immediate returns. Farming is like all other business ventures; capital intelligently placed will surely yield a good interest on long investments. Do not understand that we would advocate an expensive system of irrigation for a crop which occupies the ground only during a few months of the year; but we do claim that irrigation from tanks, in a small way, for fruit and garden products, and for some of the less hardy crops as well, will yield abundant returns. The subject is just now being strongly pushed with the hope of securing appropriations from the general govern-

ment for the building of large tanks in the highest portions of these dry lands. In these tanks the winter rains may be securely retained, and drawn upon by farmers in the locality as needed, on the payment of a nominal water rent. We believe the plan can be carried out, and would repeat that if such assistance is to be given, the farmer who skillfully uses a knowledge of both agriculture and horticulture will be the prosperous man in the early future.

Forest tree planting, as an aid to general farming, should also engage our attention. In many localities the planting of pecan and other nut timber has proved extremely profitable; but we must look beyond the immediate gain and realize, if possible, the vast good to result from an extensive system of tree planting on our western plains. The question of scarcity of wood will be, perhaps, of no moment for years to come, but if any material increase in the amount of rain-fall can be effected by tree planting, the argument in its favor becomes irrefutable. That the vegetation of a country has a decided effect upon its humidity, few will deny; and it is equally certain that as the quantity of vegetation increases over any considerable area, the average rain-fall increases also. To increase the vegetation without surface water in advance, it is necessary to plant varieties which will seek water at considerable depth. Deep-rooted forest trees will do this, bringing up the water from below and giving it off by evaporation to charge the atmosphere with moisture. We believe the states should follow the example of the central government, and make timber culture a basis for the sale of state lands to actual settlers. Texas has a vast area which she is trying to use for the best interests of her school population. To secure the greatest good to the greatest number, she should adopt some policy which will force an actual occupation of land by owners, requiring at the same time a certain acreage to be planted in fruit or forest trees, and allowing successful culture for a series of years to offset a portion of the purchase price.

At the present time immigration is pouring into the whole plains region, and it behooves each state concerned to aid the material advancement of her would-be citizens by all means in her power.

Tree planting is no blind experiment. It has been tried, and to-day the green groves springing up all over the prairies of Dakota, Kansas and Nebraska may furnish brilliant examples of its success. The farmers of these sections are but proving the wisdom and foresight which brought forth the national timber claim and homestead act, and labored so faithfully to secure to holders in fee-simple the actual possession of the public lands.

We believe the time is ripe for concert of action between the friends of agriculture and horticulture; and, in closing, may we not urge that each and every one interested shall do his utmost to advance the common cause? Let us use all means in our power for the education of those whom we seek to assist, urging, always, the importance of economy in both time and labor, and we may reach results which will startle modern agriculture out of her apathy, and link her fortunes still more closely with those of her horticultural offspring.

COLOR OF GRAPES.

BY D. S. MARVIN, OF NEW YORK.

In growing seedling grapes we are just as apt to get a so-called white grape from a black one, or *vice versa*, as one of the color of the parent vine. From the thousands of seedlings I have grown and studied, I do not think that hybridizing has any effect in determining the color of a new seedling. The coloring matters of wine have been well studied by Thresicum and Dupre in their exhaustive treatise upon wine, and, incidentally, the coloring matter of the skins is more or less studied. On page 264 it is said "the juice of most grapes is perfectly free from tannin; the skins and stalks (stems), however, contain a considerable quantity of a substance which, though not ordinary tannin, closely resembles it in properties." On page 255 it is said "color in wine is produced by the oxydizing effect of the air upon matters contained in grapes—the so-called extractine, or bodies not yet known, and the tannic acid.'

It will be seen that color is the effect of sunlight acting upon the tannic acid of the skins and those unknown bodies spoken of that play so important a part in the colors of wine. This leaves the causes of the colors of the fruit somewhat unstudied. Back of all this, it seems to me, there are causes outside of any chemical action and reaction that have led up to and originated the colors of the fruit. I refer to the influences of birds and, occasionally, animals; the interchanges of action and reaction they have produced upon the slow and gradual development of the fruit.

It is as yet unknown from what plant the grape originated, but from a careful study and personal consideration of the varied tendencies of the plant, the seedlings gradually diverging and, finally, breaking in such a number of species far away in the past, and each of these species again into such a multitude of varieties, the varieties sprouting into so many new tints and colors of skin and pulp and seeds, we must, therefore, conclude that these causes have exerted such an important influence upon some one or more of the vital economics, that the color of the fruit had come to be of very great importance to the development, growth and welfare of the plants themselves. The origin of the vine probably dates back to the earlier portions of the tertiary period, the fruit at first small and inconspicuous. Some of the plants finally sprouting a little, from favorable environment or other causes, developed higher-colored berries. The birds being attracted, fed upon the berries, and scattered the seeds upon still better land and in a more favorable climate, where they germinated and produced still higher-colored and more attractive fruit. Thus, from clime to clime and age to age, continuing, until finally primitive man, coming to the aid of the birds, recognizing the attractiveness and food value of the fruit, began its selection, and afterwards, perhaps, its cultivation, always selecting the best and largest fruit, and, like the birds, the highest-colored and most attractive varieties, for his own diatetic

purposes, dissemination and improvement; until, finally, civilized man taking the plant under control, the "grapes of Eschol" gained a historic record, with all their great attractiveness and alluring colors, the brightest colors still being always chosen by birds and man alike.

In some varieties of grapes, like the Concord, for instance, there is little or no coloring pigment in the pulp, the coloring matter, as we would suppose from its herein suggested origin, residing in the skin. There are other varieties, those of which port wines are made, in which the pigments have spread from the skins into the pulp, and even the seeds are dark in most of our Riparia grapes.

Mr. Darwin and those who have studied the colors of the plumage of birds suggest that their bright tints have originated in and through sexual selection. But the origin of the colors of grapes must be attributed to selection for diatetic purposes by the past joint action of birds, animals and man; of course, mainly, and for long ages, by birds alone. And I am convinced from a study of our own native grapes, several of which species appear older than *Vitis vinifera*, that it is generally in the oldest species, as we would conclude, that we find the darkest colors of skin, seeds and pulp, while our more recent species have the most purple, pink and red pigments.

In conclusion, the writer wishes to add that he desires the foregoing paper to be considered more as suggestions to cause others to study the topic than a finished contribution to exact knowledge.

PROCEEDINGS

OF THE

AMERICAN HORTICULTURAL SOCIETY.

(SECOND SECTION.)

THE MEETING AT RIVERSIDE, FEBRUARY 7, 8 AND 9, 1888.

The reasons for holding the eighth convention of the American Horticultural Society in two sections were briefly explained in the opening paragraph of this volume. The hiatus intervening between the adjournment at San José and the re-assembling at Riverside, is completely covered by the appended sketch by Dr. Ridpath, "Beyond the Sierras," to which the reader is referred.

At 10 o'clock A. M. on Tuesday, February 7, 1888, as per adjournment, the Society again assembled, in the First Congregational church, in the city of Riverside. Here, as in San José, all necessary preparation had been made for the accommodation of the Society and its members. Indeed, the pledge telegraphed the Secretary on March 9, 1887, was fully redeemed by the citizens of this beautiful and prosperous city and community of fruit-growers and horticulturists. A few of the visiting members who had attended the meeting at San José failed to attend the Riverside meeting. Others, however, joined us here for the first time, the local attendance being even better than at the former place.

The Los Angeles *Herald*, in its issue of February 8, has the following:

The annual convention of the American Horticultural Society at Riverside, which is now in progress at that city, is considered by those who have thought deeply on the subject to be one of the most important events that has ever happened in southern California, for the reason that the visiting members of the Society are intelligent scientists who can not fail to be im-

pressed with the wealth of this section of the country. Recognizing this fact, the citizens of southern California have made preparations to properly exhibit the products of their sections, and the *Herald* has dispatched a representative to report as full as possible the proceedings.

In the temporary absence of the President, Vice-President Munson, of Texas, called the meeting to order, and introduced Mr. Holt, President of the Riverside Board of Trade, who briefly alluded to the arrangements which had been made for the accommodation and entertainment of the Society and its members, after which the Secretary made the following

FINANCIAL STATEMENT:

Receipts.

From subscriptions for publishing President Earle's address	$ 14 70	
From books sold	52 00	
From Missouri Horticultural Society for transactions	50 00	
From 424 members for 1886–87	848 00	
From Missouri Pacific R. R., for advertising	60 00	
Total of receipts		$1,024 70

Disbursements.

Paid record and alphabetical list for members	$ 1 15
Paid office rent, fuel and lights	50 00
Paid telegraph and telephone messages	2 35
Paid printing and publishing Vol. IV	538 60
Paid express, freight and drayage	10 93
Paid postage on letters, circulars and books	138 60
Paid railroad fare and personal expenses	111 40
Paid stationery, pens, ink and pencils	11 45
Paid assistant at meeting at Cleveland	20 00
Paid hotel bills at meeting	18 50
Total expenditures	$ 902 98
Balance in hands of Secretary	$ 121 72

Respectfully submitted, W. H. RAGAN, *Secretary.*

Treasurer Evans, of Missouri, made a verbal report, stating that all money transactions of the year had been, through a mutual understanding, within the Secretary's office, and had been by that officer reported.

Messrs. Smith of Wisconsin, Ohmer, of Ohio, and Holsinger, of Kansas, were appointed a Committee on Finance, to whom the officer's reports were referred.

The Committee on Order of Business was requested to report at the opening of the afternoon session.

On motion, the Society adjourned.

Fourth Day—Tuesday.

AFTERNOON SESSION, February 7, 1888.

At 2 o'clock President Earle called the meeting to order.

Rev. George H. Deere, of Riverside, delivered the following

ADDRESS OF WELCOME.

Ladies and Gentlemen, Fellow Horticulturists from the far East:

Southern California in general, and Riverside in particular, through me, would utter its most cordial greeting and warmest welcome. Our intelligence is of such kind as to appreciate the fact that the practical horticulturists require not only muscle and sinew, but brains. The substance of our welcome you have already received. *It met you when your eyes were weary with pictures of desolation on your approach to our borders. The raisins were honeyed words from our vineyards; the oranges golden speech from our orchards, and the flowers the smiles of our fair women. You were doubtless made to feel that you were indeed approaching Eden. Milton, who is good authority in matters of tradition, says "Eden stretched its line from Auran [presumably Los Angeles] to the royal towers of Selencia" (borders of Arizona). In this fertile soil (San Bernardino, Los Angeles and San Diego counties) this far more pleasant garden God ordained. All trees of the noblest kind for sight, smell, taste, he caused to grow; and amidst them stood the tree of life, high, eminent, blooming ambrosial, vegetable gold. This was the original Riverside Washington Navel. Dr. J. P. Greevy and Jude Brown, in June, 1870, believed they had found the site of the old garden, though reduced to a desert by the ages since the first horticulturists were turned out for misconduct; and on the 20th of September, Dr. Greevy, with the veteran colonist Jude and John W. North, was the first to lodge within its limits. Dr. Shugart and Dr. Eastman and others soon joined them. Doctors, lawyers, clergymen and men of culture were numerous among these adventurers. They began to build; what, they hardly knew themselves. It was a sorry work amid the frowning mountains. It was all climate then. Here and there they planted little sprouts, and watered them year after year, as best they could, waiting all the time patiently for the result. Los Angeles and San Bernardino, only small settlements, laughed

*See Dr. Ridpath's sketch, "The Reception at Indio."

at what they considered the foolhardiness of these sturdy settlers, and even now they don't, or pretend not to, know what we have done. S. C. Evans came five years later. He wrote to ex-Governor Downey, asking as to the advisability of a move to Riverside. That worthy gentleman told him to never undertake it, as it was a God-forsaken country. But, notwithstanding this, men of intelligence, brain and culture saw a future in the place, and they came here, and behold the result! And now let me say to you, when you meet a woman who stood firm by her determination in these early pioneer days of trial, uncover your head in her presence.

The tradition some of them recently discovered, concerning our pet orange, I think I had better give you: The nuptial festivities of Juno, queen of the Olympian heaven, were graced by "ambrosial" fruit and vegetable food, contributed by Terra, goddess of earth. So privileged was this fruit that Juno committed it to the exclusive care of the three daughters of Hesperus, with a dragon to guard it in their far-off isle in the west. The story of the most difficult of the twelve labors of Hercules, relating to the search and finding of these apples of gold by Atlas, while Hercules shouldered the world, is well known. From the stolen fruit brought by the strong god to his tyrannical master, Eurystheus, have descended the degenerating oranges of the world.

The golden apple which Discord threw, in her anger, marked "for the fairest," among the goddesses at the wedding of the father and mother of Achilles, and which Paris awarded to Venus, Discord filched from the golden tree of the Hesperides. Homer's glorious story of the Trojan war, which sprang from that award, does not record what became of the apple. Recent research in the archives of tradition, however, supply the needed light. Venus loved the apple. She gathered its vitality and luscious qualities into her cestus and made them a part of its substance. When the day of doom came to the Olympian hosts, bewailed by Schiller, but made the poet's joy in "The Dead Pan" of Mrs. Browning, Venus fled, bereft of divinity, over land and sea, round and round the world, and lost her cestus in midair. It floated slowly to the earth, dropping into an open, shallow seam, which soon closed over it. Centuries passed before the wonderful cestus yielded to natural forces, decayed, and set free the vitality and precious qualities which at once, on gaining liberty, began growth in tree form to reproduce its kind. History emerges from tradition now, and tells how a bud from the golden tree of the Hesperides was brought by the way of Washington to the site of the "garden planted eastward in Eden," whose "fruit of vegetable gold" is in our day known as the Riverside Washington Navel.

Allow me in conclusion again to welcome you most cordially to our city. Don't feel timid about speaking to our people wherever you meet them. They will be glad to meet you, and if you should find, anywhere, a door open, please walk in and be at home, for every threshold extends its hospitalities to you. I hope your labors among us may be productive of a vast amount of good to you and to all.

President Earle responded briefly, as follows:

Ladies and Gentlemen:

It is with a great deal of pleasure I respond to the welcome you have extended to us. I came here four years ago. However, I then had but one day to give you. That day impressed me so much that I had a longing desire to some day hold an American Horticultural meeting here. And now, I am happy to say, my desire is realized; and though not many of us are here, yet there are enough to represent the Society.

We have been in California for some weeks, and everywhere we have met with the greatest courtesies and have been receiving the same warm hospitality extended to us here. We have been tendered such banquets and receptions as never have been experienced by any party which has hitherto visited your state. We have been toasted, banqueted, driven through orchards and farms, and received with open arms by every city, town, village and hamlet. Everything has been done in such a cordial and earnest spirit that we have no words to express our appreciation and gratitude. We have not to teach you, but to learn. Those who had not been here had no conception of the magnificence and grandeur awaiting them, which is all due to the industry of the inhabitants of this fair land. There is nothing like it, I venture to say, in the world. We went three or four hundred miles north of San Francisco but did not reach the limit of this golden land, and now we are traveling south, and have been for two days, and yet no limit. We have found surprising things in the north. There, under the very shadow of Shasta and perpetual snow, we found trees loaded with fine tropical fruit. There is this peculiarity about California: You can produce any of the tropical fruits in every section of the state. No state in the Union can produce such magnificent apples, pears, peaches, apricots, cherries, and grapes. I only speak from a market standpoint, for you know that it makes little difference whether they have the flavor or not. No state grows every kind of stone fruits as you grow them. We grow a few but you do not know under what difficulty they are propagated. It impresses us so strange as to be almost incredible that here you should represent Pomology in all of its phases. We are pleased to note that you are not only raising fruit but homes; *good intellectual* society with all the rapid growth. We are glad to note that not all is for money, but for comfort and the better instincts. Nothing has impressed us more than the good people we have met everywhere. In selling corner lots and speculating you have not lost sight of the higher motive; not only have you great wealth, but a Christian society. When you consider the physical features of California, you can not but recognize the promising future. The Hebrews were born looking out over the sea. Rome, Greece, England, France, all were looking westward. The tendency of all good things is west. Civilization must halt here, and here arrested—good will be the result. Barred from further progress you will be stimulated to great energy. We have thought at every place, as we journeyed through

this state, that this was the best. We have continually said this is surely best; but I said wait, you have not seen Riverside yet. I knew what was here—I knew how a great desert had been changed. The best has come out at the end, just as I anticipated it would. I am glad we are here. Some wondered why we came here last. But we do not regret it, and you will not be sorry. Thanking you for this hearty welcome, I will express the hope that the work you are doing may greatly prosper, and that you are just in the beginning of an age of prosperity not known anywhere in the world.

At the conclusion of the President's response, the following original poem was read:

ODE CONVENTION-AL.

BY J. E. CUTTER, OF RIVERSIDE.

What strange invasion pours adown the glen?
And whence such troops of frozen-bearded men?
Say, watchman, ho! way up in the Cajon!
Who may they be, and whither are they bourne?

"Seven days and nights they've fled the blizzard's wrath,
And west-sou'west have held their hopeful path.
So far they came, it seemed too like a sin
To bar the pass, and so I let them in."

Right worthy watchman, these our luck shall share,
But keep old Zero t'other side with care!
So, friends, you're welcome—each to what may suit.
Now doff your furs and have a litle fruit.

Old Bacchus, wiser than our modern day,
Hand-squeezed his grapes and sucked the juice away;
Nor still, nor saccharometer had he,
And never got his wine by chemistry.

But Bacchus' bowl and chemists' fizzing tun
Have here no place. Beneath the kindly sun,
In sweet profusion down the laced lines,
We dry the fruitage of the sheeny vines.

The orange? Yes, it rules the vale no doubt.
Just cut transverse and turn it inside out.
The cost, you'd know? You've nothing, gents, to pay;
Put in your bills and taste—there, that's the way!

Mr. Smith, of Wisconsin, from the Committee on Finance, made the following report, which was adopted:

Your committee request the privilege of reporting as follows: We have examined the Secretary's and Treasurer's reports, and find them to be correct. We also find that an allowance of $500 was made to the Secretary at the last New Orleans meeting, of which $326.88 has not been paid. We also find that the Society owes to Treasurer Evans the sum of $200, money advanced by him some three to four years since for the purpose of publishing Volume II of our reports. Your committee would recommend that both of these amounts be paid from the money now in the hands of the Treasurer.

J. M. SMITH,
N. OHMER,
FRANK HOLSINGER.

The Committee on Order of Business reported, recommending the hours of meeting to be 9 A. M., and 2 and 7:30 P. M., which was adopted.

An invitation from the citizens' committee to take a carriage drive through the city and suburbs was accepted, and the hour fixed for 9 o'clock A. M. to-morrow.

LETTERS AND INVITATIONS RECEIVED.

President Earle, of Illinois—Since our meeting at San José a number of letters and invitations have been received. These give additional evidence of the high esteem in which our Society is held. The fir-t I will read is a series of resolutions from Phœnix, Arizona:

PHŒNIX, A. T., Feburary 3, 1888.

To the President and Members of the American Horticultural Association, Riverside, Cal.:

WHEREAS, The members of the Maricopa County Immigration Union and citizens of Salt River Valley, Arizona, are deeply interested in the development of the horticultural resources of the country, for which you are laboring so earnestly and believe the grand possibilities of Central Arizona in this field, are, as yet, hardly realized in the present fruit centers, and,

WHEREAS, The Salt River Valley, covering an area of 400,000 acres, owing to its cheap and fertile land, which is especially adapted to fruit, wine and raisin production, and in addition having the advantages of an abundant water supply, mild climate, near markets, a total absence of tree and vine pests, and maturing fruit three weeks earlier than California, affords perfect conditions and unrivalled advantages to the scientific horticulturist, and

WHEREAS, Horticulture in the valley having long passed the experimental stage, it is desired to call your attention to this part of the territory as the future fruit and vineyard district of the west, therefore, be it

Resolved, That the Imigration Union and citizens of Maricopa county extend you a cordial invitation to visit Salt River Valley and make examination of its resources and attractions, and assure you of a pleasant reception by our people.

T. J. TRASK, *President Maricopa County Immigration Union.*

L. M. LEMON, *Secretary.*

We next have a cordial invitation from the young, but prosperous, society of Whitman county, Washington Territory:

COLFAX, WASHINGTON TER., January 30, 1888.

Parker Earle, Esq., President American Horticultural Society, or, W. H. Ragan, Esq., Secretary American Horticultural Society:

GENTLEMEN - Having observed that several members of your honorable Society intended to return east by way of the Northern Pacific Railroad, we concluded to extend an invitation to come by way of Colfax, the county seat of Whitman county, and address our young horticultural society in this new but rich country. Should any of you conclude to favor our society (which we most earnestly hope you will), you will come to Palouse Junction, and there take the O. R. & N. C. R. R. to Colfax, eighty-nine miles; and while we can promise you no money, we will give you the best entertainment in our power. Our society is not a year old yet, so that we need your help very much, and hope you will favor us with your presence. We are deeply interested in your good work, and wish you every success. Should any of you conclude to come this way, please let us know in time to call a meeting, and oblige, yours truly, J. CAIRNS,

President Whitman County Horticultural Society.

And here is a letter of regret from the President of the Wash ington Territory Horticultural Society:

TACOMA, WASHINGTON TER., January 30, 1888.

Secretary of the American Horticultural Society, Riverside, Cal.:

DEAR SIR—I send you by mail a package of the *Northwest Horticulturist*, of the November and January numbers. Please be kind enough to place them so they will be received by the members of the Society. I expected to be with you, but circumstances of a nature which I could not control prevents me from being present. I anticipate for you a grand meeting and much good accomplished.

Yours truly, HENRY BUCEY,

President Washington Horticultural Society.

Our next letter is from an esteemed, but newly-made, friend, prominent in viticultural matters on this coast:

SAN FRANCISCO, CAL., February 6, 1888.

Parker Earle, Esq., President American Horticultural Society, Convened at Riverside:

MY DEAR SIR—I find it impossible to attend your meeting at Riverside as I had promised and expected. This is a great disappointment to me. Will you kindly express my regret to the Society, the recollection of which I shall ever cherish, particularly the members of the northern excursion, to whom, with yourself, I owe particular gratitude? I am detained by the work of preparing for the Annual Viticultural Convention, to be held in this city March 7 to 10. This will be an exhibit of all viticultural products, together with the reading of papers and discussion on various topics relating to the industry. The Board of State Viti-

cultural Commissioners takes pleasure in inviting any members of your Society who may be in California during March to attend this convention, promising much of interest to horticulturists.

Trusting I may soon see you all in California again, I am,

Yours very respectfully, JOHN H. WHEELER,
Chief Executive Viticultural Officer of California.

And here is an invitation from the neighboring city of San Bernardino, and let me express the hope that those of our members who can will respond to this cordial invitation:

SAN BERNARDINO, CAL., February 9, 1888.

Mr. W. H. Ragan, Secretary American Horticultural Society:

DEAR SIR—The Board of Trade and citizens of San Bernardino beg leave to extend an invitation to your Society to visit their city on Friday, the 10th inst. We will try and make your stay with us agreeable, if you see fit to accept.

Yours truly, R. F. CUNNINGHAM, *for Committee.*

I will only present one other letter, and that from our far-off friend and co-laborer in the ancient empire of Japan:

IMPERIAL COLLEGE OF AGRICULTURE AND FORESTRY,
KOMABA, TOKIO, JAPAN, January 28, 1888.

W. H. Ragan, Esq., De Pauw University, Indiana:

DEAR SIR—You maybe thought that I would not write you any more from Japan, but my advantage of making you as a friend is after I got home. I left New York in September last year, and got at home in 4th of inst., during that time I spent in traveling over Europe and voyage in tropical oceans. The art of horticulture in Europe is intensive, and I think to be ahead of America.

I am specially interested and pleased to study tropical fruits, of which I have collected and brought to home over thirty different specimens. They are very fine and nice fruits. Vegetables are rather inferior and poor on account of intense heat, and causes to run into flowers.

I told your Society of American Horticulture that we should exhibit some fruit from Japan on the occasion you hold next meeting in San Francisco in this spring. It is a great regret that I can't find anyone would send our horticulture products to your meeting, yet nor I am unable to send some by myself, because soon after I have got home I am compelled to give lectures to two classes of students in the college; while my things are laying disorderly, and my mind is unsettled yet on hearing different news, or olds, happened during my absence. Although Mr. Van Deman told me that the meeting will be in San Francisco in coming February, when it is postponed in later date. Please tell me the address of local committee in San Francisco. I shall send some of our dried fruits. I hope hereafter of the transactions of the Society to be sent to Japan, so that if you permit me as a corresponding member, I will be very much pleased.

With the best wishes, I am yours very truly, K. TAMARI.

Mr. Lewers, of Nevada, read the following paper:

FRUIT-GROWING IN NEVADA.

BY ROSS LEWERS, OF NEVADA.

Mr. President, Ladies and Gentlemen of the American Horticultural Society:

Nevada for the first time asks of you the privilege to present some of her claims to recognition as a horticultural state, having come as you did from all over the union and the Canadas to our great neighboring state to see and judge for yourselves of her justly far-famed agricultural productions —this wonderland of the golden west, where an almost endless summer and a fertile soil combine to produce a nearly perpetual vegetation, and in such excellence and profusion that nature meets you more than half way in your endeavors to promote the growth of everything that conduces to the happiness of mankind. We can not lay claim to the almost uninterrupted vegetable growth that prevails in southern California, but our winter season, rather mild, but sufficiently rigorous to allow nature to rest, may be a blessing in disguise, as evidenced by the excellence of our agricultural products, which, in quality, rank among the first if not at the top of the list. The territory of Nevada is so vast and the soils and climatic conditions so varied, that it is impossible in a paper like this to convey any satisfactory idea of her horticultural capacities in every part, so I will confine myself to that portion with which I am most familiar—the western part of the state.

Fruit culture in Nevada is yet only in its infancy, and what little is planted has been done mostly near the Sierra Nevada mountains, on the margins and elevated slopes of a chain of valleys which extend north and south along their base. The great drawback to successful and extensive fruit-growing in this part of the state is late spring frosts, which occur generally in May, when the trees are in bloom, or immediately after, but varying much in intensity in different years and in different localities. This elevated belt before mentioned enjoys an immunity from frost much greater than the adjoining valleys, owing, probably, to the cold air settling by gravitation and forcing the warm air upwards.

Various means have been tried to counteract these spring frosts, or to prevent the trees from blooming until they are past, such as building fires in the orchards at night, or packing snow around the trees in early spring, but without any appreciable good results. The most effective remedy suggested by the experience of the writer is, in respect to apples, at least, to plant varieties that are known to succeed in a belt along the northern border of the southern states, such varieties not being very sensitive to heat in early spring, and, consequently, not blooming till after all danger from frost is passed. Nearly all kinds of hardy tree fruits are successfully grown in this part of Nevada. Peaches, and even apricots, are here reasonably sure of fruiting; besides most of the hardy berries are cultivated with success; amongst these, strawberries and raspberries are deserving of special men-

tion on account of their fruitfulness, and particularly on account of their superior quality. These berries when grown here have a beautiful appearance, a rich, fruity flavor, and remarkable solidity, all of which make them very desirable for table fruit, for preserving and for shipment. Raspberries here may be considered a sure crop, as they do not bloom until the time for spring frost has passed, and the winters are never so severe as to kill the canes. There is here a remarkable absence of nearly all the known fruit diseases and pests, the only one of any serious consequence being the codling moth, and even that in very limited quantity.

All the fruits grown here are of excellent quality, being distinguished by their beauty of color and form, their rich flavor and good keeping qualities. The Bartlett pear is here a prolific and almost sure bearer of large, fine fruit, but amongst these good fruits the apple, the king of all fruit, asserts its royal prerogative and stands up preëminent above them all, and allows us to form some idea of the reason why our first parents were willing to forfeit their title to the Garden of Eden.

The best way, perhaps, to describe the merits of this noble fruit when grown on the eastern slope of the Sierras is, to state that, in the World's Exposition, at New Orleans, in 1885 and 1886, for apples Nevada was given first premium for eight varieties, "first degree of merit" and "second best display," also "best exhibit of dried fruit."

Now, I know that those apples were grown without any idea of exhibition (as I raised most of them myself), and were selected without any particular care, besides were carried a long distance without ice, and afterward remained in a hot climate about three months before being judged. From this an idea can be formed of what they are in their chosen home.

Many kinds of apples when grown here are so changed in their general character that it is very difficult to recognize them, those only with the most strongly marked characteristics retaining their individuality, and even they get some addition to their beauty; for instance, the Greening and Newtown Pippin are frequently red-cheeked, the Spitzenberg deep purple, inclining to black on the side next the sun, and the Bellflower pink on yellow ground.

Whether the beautiful color and fine quality of all the fruit grown here is attributable to the soil, which is generally a black sandy loam, rich in potash, ammonia and iron, to the rare atmosphere at an altitude of about 5,000 feet, to the long, mellow ripening season that always prevails, or to a combination of all of these, I do not pretend to say.

I have before mentioned the great impediment to extensive fruit-growing in this part of Nevada—late spring frosts—and to show that this thermal belt that I have endeavored to describe is reasonably free from their injurious effects, I will instance my own experience in fruit culture on a part of this belt, perhaps as favorably situated as any, but not exceptionally so; in the past twenty-five years I have had twenty-one full crops and four failures, none of these failures being total, and previous and up to the past year I have had ten full crops in succession.

All this chain of valleys I have mentioned has an abundant and never-failing supply of water for irrigation purposes, and most of the land in these valleys lying nearest to the mountains requires very little irrigation, being supplied with sufficient moisture from springs. In connection with this water supply there are certain peculiar conditions that prevail here that I think are worthy of notice. One of these is that, wherever the forest timber has been cut off the mountains, a new growth of the same kind of timber has sprung up, much thicker than the original growth, and none of this young timber will start to grow till the old has been cut down. Another is that the water supply from the mountains is greater and more permanent than it was before the timber was cut off. The reason for this appears to be, that the wind has a more unimpeded course, and as all the snowstorms come from nearly the south, the snow is blown from the south sides of the ridges to the north side, where it is piled in deep, solid drifts, and not being ex-exposed directly to the sun's rays it melts very slowly, consequently it affords a more permanent supply of water; also spring floods are less frequent than they formerly were for the same reason, as there is less snow on the southern slopes to be melted off quickly by the sun.

DISCUSSION ON MR. LEWERS' PAPER.

President Earle, of Illinois—We are pleased to hear from Nevada. This is our first paper from that state.

Mr. Ragan, of Indiana—Mr. Lewers is our Vice-President for Nevada. As such he is making himself felt. He has just handed me the names of about six (including the governor of the state) new members. Such Vice-Presidents are worth having.

Mr. Munson, of Texas—Mr. Lewers, what are the meteorological conditions of your state?

Mr. Lewers, of Nevada—Our maximum temperature is about 90°, and our minimum rarely below —10°. Our precipitation is mostly in the form of snow, in the winter season Our summer rains are light, and mostly in the month of July. Irrigation is our chief dependence, the melting snows of the Sierras being the source of water supply for this purpose. Fruit-growing until recently has been for home consumption, very little having been marketed. As stated in my paper, the clearing up of the mountain forests has seemed to increase our water supply. This is doubtless due, as stated, to the drifting of the snows into the mountain ravines, where its great depth preserves it better throughout the season. Our forests are mostly of pine timber. Our winds and rains are generally

from the south. The timber of the Truckee valley is principally fir instead of pine. It does not grow up so rapidly as the pine when once cut off.

Mr. Van Deman, of Washington, D. C.—Are grapes grown successfully in Nevada?

Mr. Lewers—They are not generally grown, but I have seen some fine raisins and raisin grapes of Nevada production.

Mr. Brown, of California—In southern California we are quite differently affected by the removal of the mountain forests. The summer flow of springs in the San Gabriel valley have been reduced more than 20 per cent. by the removal of the mountain forests surrounding us.

Mr. Lewers—I did not aim to convey the idea that our rain-fall had been increased by the removal of the mountain forests, but that the water supply had been rendered more permanent and enduring, the result of the drifting snows being longer preserved in the mountain ravines, from their greater depth and bulk.

The President announced the following Committee on Nominations of officers: Prof. W. S. Thomas, of Arkansas; Mr. Abbott Kinney, California; H. E. Van Deman, Washington, D. C.; George P. Peffer, Wisconsin; J. G. Bubach, Illinois; S. Johnson, Indiana; Prof. J. L. Budd, Iowa; Frank Holsinger, Kansas; J. W. Samuels, Kentucky; Wyman Elliott, Minnesota; L. A. Goodman, Missouri; S. Barnard, Nebraska; Ross Lewers, Nevada; I. H. Budd, New Jersey; T. S. Hubbard, New York; J. Van. Lindley, North Carolina; G. D. Hewson, Nova Scotia; N. Ohmer, Ohio; Dr. Cardwell, Oregon, and Nat. Stevens, Texas.

L. A. Goodman, Secretary of the Missouri State Horticultural Society, read the following paper:

ORNAMENTATION OF OUR COUNTRY HOMES.

BY L. A. GOODMAN, OF MISSOURI.

The distinctive difference in our country homes I can no more plainly show to you than to cite you to the wide difference that exists, not only in our portion of the country, but which I see everywhere here in California, and that is in the homes of our stock men, and peculiarly our agricultural portion on one hand and those of our horticulturist on the other hand.

A man whose whole time and interest are devoted to the breeding and raising of cattle, horses, mules or sheep, can scarcely find time to spend a day or a dollar on his yards and gardens in the way of ornamentation, whereas the horticulturist never fails to find time and means to beautify his yards. But it is something practical that my subject calls for, in helping to awaken an interest in beautifying our homes and how to do it. What I have to say will not be new to many of you, and yet it is the same old story of "line upon line."

Our country home varies from that planted in the native forests, surrounded by many old trees, perhaps evergreens, a large yard in grass where the horses are often turned to graze, or the chickens and hogs are allowed to roam at will, to that of the pioneer on the prairies without a fence or a tree about the home, where oftentimes not even grass is to be found, and horses, mules, cattle, sheep, hogs and chickens can "go as you please." Between these two we have all grades of houses and yards, some pleasant, some agreeable, some tasty, and some even handsome and picturesque. I do not wish so much to instruct the horticulturist, or to induce him to plant, as I do to awaken an interest in the minds of many of our country home keepers that much taste can be displayed in the planting of our new and old places, and that it can be done so easily.

First, then, if it is necessary, and I am sorry that it is, we will have a fence; not a heavy fence, but one just as light and low as the circumstances will permit. So many of our yards are spoiled with their fences; in fact, if it could be possible, I would like to see the fences abolished entirely, but as this can not be done, do the next best thing and make them as light and airy as possible. Next, let us have a green lawn. A good set of blue grass forms the most beautiful of all yard fronts. Sloping or rolling, as the case may be, it matters not if we only have it well covered with a good grass sward. The position of the home from the road is a very important matter, for if we have our house too far from the road we will have more lawn than we will take care of, and it will cost too much to plant it properly, and hence we find so many places so sadly neglected.

I have found that the greatest drawback to the pleasant planting of our country homes and their ornamentation is a want of knowledge of what to do and how to do it easily. The farmer is so busy that he has but little time to give, and little knowledge, and *no* thought on the subject, so that it is no wonder he lets the matter run at loose ends. I have found in many instances where I have met such a friend and such a place, that one-half hours talk with him on the ease and beauty of his place with but little trouble and less expense, that invariably he was induced to do it. But, above all this, if we can get a love of outdoor life and the beauties of our trees, we have a lever to work with that will move the hills, rocks and stumps and make a yard. Then, if we can suggest some easy means of reaching the desired end, we may be sure that there are many who will adopt it. A house standing about 100 ft. to 150 ft. from the road, and, if on a corner, about the same

distance from each road, will give any farmer all the room he will need for the front yard.

Do not plant in regular order, but by all means plant in clumps or groups, leaving a bare spot of lawn and a clear view from the house to the road, especially from the principal windows of the kitchen and sitting-room. Plant a clump of evergreens here, a clump of shrubs there, a clump of one kind of deciduous trees here, another kind there; a bunch of a variety of hardy herbaceous plants in one bed and a bed of roses in another.

These being of common varieties cost but little and are soon planted. But what I want to warn you against is indiscriminate planting. If you have not enough time and money to plant all at once do not, I pray you, do not by any means plant a tree, or bush, or rose, or shrub, just as the notion happens to take you, or just because you see that there is room between two other trees to put it. Such planting will make your yard a mixed medley, and will be a tangled mass of trees, shrubs and vines in the years to come.

If you can not plant your yard at once, and wish to keep planting as you find things which suit you, or as they are given you, plant judiciously and with system; have a plan and follow it. Have your clumps of evergreens, deciduous trees, shrubs and roses, and when you do plant any of each of these, plant it in its proper place with its proper kind, and in after years you will be glad. Another mistake, and a very great one, is in thinking that there is no beauty except in a large tree or trees and shrubs. Now, the beauty of them is in seeing them grow and caring for them until we come to love them as we do our children. Plant then, small and young trees, and plenty of them, so that the growth may gladden your eyes and hearts every time you return to your homes.

Does your heart go out in love to your home and your children when away from them; do you love to have them about you, on your back, maybe, loving and caressing you? Well, if so, you can realize how much a true lover of the trees and plants thinks of the ornamentals of his yard. These trees and shrubs will grow in your affections and the affections of your children until they come to love every tree and shrub in your yard. Don't you believe it? Well, just try and cut down a half-dozen of them because they are too thick or are spoiling one another, and have your wife and children, as I have had, pitch onto you and scold and beg for the lives of the trees, because you are cutting down their friends.

I well remember an instance where a large, old white oak had been for years, and the American ivy covered it to a hight of sixty feet (where it had been sawed off) until it was one solid column of green in summer and scarlet in autumn; how every one in the whole country admired the beautiful column, until it seemed as if it were a part of the beauty of our village. One day a heavy storm came and it was laid flat on the ground. The people in passing could not be kept out of the yard, but would come in and express their sympathy for the old tree, as for a lost friend. Pardon the digression. I am anxious to show that the best investment we can make is to plant a few

trees in our yards and let them grow with our children, and our love with them. In my own home, I think more of my trees than I do of my house, and I have a good one, too.

TO PLANT CHEAPLY.

Plant a clump of elm, a clump of sugar maple, a clump of soft maple, a clump of white pine, a clump of Norway spruce, a clump of red cedar, a clump of shrubs, *Althea, Wigelia* snow ball, a clump of the lilacs, a clump of spirea, a bed of roses, hybrids and June, a bed of peonias, phlox and hardy perennials, and, if you can afford it, a bed of house plants. These, put in proper places, so as not to interfere with the view from the house, will, with very little expense, give a very pleasant yard. Small evergreens can be had one foot high for ten to fifteen cents. Trees two years old of the varieties given at about the same price. Shrubs two years old at five to ten cents; roses at fifteen to twenty cents; herbaceous plants at five to twenty cents. The total expense of such planting of such a place need not exceed $10 to $15, and will prove *the best investment a man ever made on the farm.*

The roads and paths should be as few and simple as are needed only, because they take more time to keep them well than any other thing on the place. A drive from the gate, circling or straight, to the side of the house, and thence to the barn, with a path from the front gate to the front and side of the house, is all that is needed. This path if angling or curved will be much the better, but never so much so as to cause a person to turn out of the way in going from the house to the gate.

The back yard may be used for indiscriminate planting, and many things not proper to go into the front yard can be used in the rear, and without so much system. In fact, it may be a mixed mass or a conglomeration if you choose to have it. Plant thickly, and if some die you do not miss them, and as soon as they begin to crowd take them out by transplanting or cutting down. Do not be afraid to cut down *when* necessary any more than you are to plant *where* necessary. On my own place I have cut down twice as many trees as I have left, and will have to do more of it.

The planting of larger places, or ornamentation of city homes, is not in the province of my paper, and yet I can not help but notice the great mistake that the city people are making of letting their places be so much crowded as to spoil their beauty. I find that to be the case much more so in California than even in our own state. One fine, well-perfected tree, with plenty of green lawn, makes a prettier show than a dozen planted too closely, and one well-grouped clump of trees are much more beautiful in a lawn than would be a dozen scattered here and there. If you do plant thickly or indiscriminately, be sure in after years to begin your thinning in time.

Ornamenting our country homes can be very much assisted by roadside planting. Not by any means planting in single lines of trees about the roads, but if the road is straight, then, by all means plant the trees in groups along the road, and at every corner, especially, make a clump of trees. If the

road is irregular or is very winding, then one, or, still better, two or three rows of trees along the line lends much beauty to the drive. But one straight line of trees along a straight road is too much of a sameness, and especially so if the land is very level.

Such planting adds very much to the beauty of our country homes, and its tendency is to build up and elevate the tone and character of our people. A roadside planted in groups gives a very pleasing effect to the traveler. And then you all know that trees do so much better when growing together than in single rows. A road with a clump of elms here, a clump of maple there, one of white ash, one of pine, one of larch, one of sycamore, one of spruce and one of cedar will give such a delightful sense of relief to the passer-by, that he invariably falls in love with the surroundings.

I wish that I might arrange a plan of planting and have a cut made, with the number and varieties of each kind of tree, which would be of some assistance to those who would learn; but it is with this matter as with many others with which the horticulturist has to deal. He is a teacher and a preacher to every one whom he meets, both by example and precept. I believe that he is the most liberal-minded of all our public men, and is able and willing to give advice without money and without price, and yet the people will not always follow.

I have given directions for the most simple manner of improvement for our country homes, because in my own practical work I have found such advice to be most generally followed, and have never yet failed when talking to a farmer in convincing him of the real *money value* of such an investment, and have invariably had him follow it.

A word or two about forming our lawns and I am through. I have always had the farmer plow up the whole yard in the fall, level and harrow well, as he would for a flower bed. Sow wheat and then timothy and then blue grass, two bushels per acre, and in the spring two bushels more per acre. I do this that we may at once get a green yard, and then when the wheat is cut we will still have a green surface, and that long before the blue grass forms a sod. By the second or third year the blue grass runs out the timothy, and we get a good sod by mowing only two or three times a year, which is about as much as I find the farmer willing to do.

Do not understand that this plan of forming a lawn or planting trees can be applicable to our towns or cities, or even many of our larger farmers, but it is the only practical way of improvement of our country homes, and we may be sure if thus once started the love for it will grow and grow until it has found something better.

Every one who visited San Rafael will remember with delight the long winding road up to the top of the hill where we got the view of the ocean and bay, and there on the top what a delightful view lay before us in the valley, and how judiciously the planting had been done in clumps and clusters all over the whole hill. Hon. W. T. Coleman planted better than he knew when that was done, and the 375,000 trees which he planted have been

so beautifully arranged in clusters and groups that they add an hundred-fold to the beauty of that beautiful landscape which lay before us on that morning. I called on those near me at the time to be careful to notice the beauty of the planting while they were admiring other things. Well, this was just the object lesson I wanted to give, and the one I wanted to illustrate in my paper.

DISCUSSION ON MR. GOODMAN'S PAPER.

Mr. Smith, of Wisconsin—It appears to me that four bushels of blue grass seed to the acre is pretty heavy seeding.

Mr. Goodman, of Missouri—Yes; but it pays in starting a lawn to sow heavily of seed. I would sow at the rate of two bushels per acre, in the fall, and re-sow at the same rate the following spring.

Mr. Ohmer, of Ohio—I believe in liberal planting of trees. I prefer to plant them in groups. Trees are a benediction to the home. Even tramps will bless the man who plants trees.

Mr. Munson, of Texas—Blue grass will not grow everywhere. In Texas, and, if I mistake not, even here in California, the Bermuda grass makes the best turf. Australian rye seems to be a popular lawn grass in California. It produces a sward almost equal to blue grass.

Mr. Van Deman, of Washington, D. C.—Spring is the better time for seeding the lawn, and three bushels of blue grass seed per acre is ample. Small grain should never be sown with the lawn grass.

Mr. Munson—Burmuda grass is not propagated from seed, but from small pieces of turf which are transplanted. It is effectually killed by cold of five degrees below zero, and, therefore, will not do in the northern states. It forms a good sod the first year, if properly planted.

Secretary Ragan, of Indiana—This is a good paper on a good subject. Simplicity is the beauty of landscape gardening. The work is too often overdone. Walks and drives should never be made simply for the purpose of exhibiting the artist's skill in making graceful, but meaningless curves. Every walk should represent an idea; that of reaching an object—not in stiff, straight lines, but by natural curves, such as the pigs will make through the clover, in finding the best apples in the orchard. Over-planting of trees

and shrubs is another common mistake. It requires great skill and foresight to guard against this tendency to crowding, and it takes nerve and decision of purpose to thin out such overcrowded grounds before serious consequences follow. Over-trimming also frequently occurs. If I were to criticise California methods, it would be in this latter particular. Hedges and topiary training are admissible to a limited extent only. The natural habit, but slightly restrained, of the tree or shrub, as a rule, is far preferable to an excess of shearing and training. A rich, luxuriant turf, well kept, with a few representative trees and shrubs, is the acme of beauty and perfection in the adornment of either public or private grounds.

Mr. Rudisill, of California—Deciduous trees are preferable in countries where there is a large rain-fall. Here we have something of an arid atmosphere, and evergreens succeed best. The pepper tree is one of our best street trees. The eucalyptus succeeds well also. The Monterey cypress is a very popular tree.

Prof. Budd, of Iowa—Cypress and peppers are very handsome, but why is it that we don't see more magnolias here?

Mr. Rudisill—Eleven years ago Magnolia avenue was planted, but our climate has proved too dry for them, and they are now generally replaced with the pepper, eucalyptus, grevilleas, palms, etc.

Mr. Van Deman—One of the vices of California methods is too much trimming. Such mutilation is injurious to the tree, and barbarous in the sight of cultivated tastes.

Mr. Munson—The cypress hedges, as we see them in California, may be excepted from the general rule condemning trimming. It certainly seems admirably adapted to this artificial mode of training. I am glad this discussion has sprung up. We have been devoting too much of our time to fruits in these meetings. This is the dawn of an æsthetic age when we should give more attention to the beautiful in nature.

Col. Veal, of Texas—It seems to me that the denunciation of trimming has been carried too far. To my eye such training produces forms pleasing to look upon.

Mr. Van Deman—This is largely a matter of taste, although it may sometimes be bad taste.

Dr. Parker, of California—A good lawn in this country is an expensive luxury. I would rather plant and keep up an acre of orange trees than an acre of blue grass lawn in this valley.

Mr. Hubbard, of New York—One thing I like here, is the almost universal absence of all fences. To my eye fences are an abomination.

Prof. Budd—How do the Australian acacias succeed here?

Mr. Rudisill—Generally speaking they do well, requiring but little water.

The following paper was then presented:

OUR NEGLECTED NATIVE FRUITS.

BY W. H. RAGAN, OF INDIANA.

During the earlier years of American fruit culture all effort seems to have been expended in seeking to adapt the domestic fruits of Europe to culture in our climate and soil. With many of the orchard fruits this was at least partially successful. Long since, however, most varieties of these, of foreign origin, have been superseded by their more valuable American offspring. This fact may be satisfactorily attested by a comparison of the lists of Coxe and other early American authors, with lists now most popular. A large per cent. of Coxe's list of apples are of European origin, while a still greater proportion of his list of pears are foreigners.

Thus we may run the then short list of species, as well as of varieties of fruits in cultivation, through, from the apple to the cherry, only to find that American species were wholly neglected; that the only grapes worthy of notice were of the *vinifera* species; the only plums of species *domesticus;* the only raspberries admitted to our gardens were foreign born; the only gooseberry worthy was from over the waters; the only strawberry had its origin in the mountains of Europe. It is not strange that this condition of affairs should have existed and should have been followed up so persistently, even down to recent times, by our forefathers in fruit-growing, since varieties introduced were supposed to be *the best.* As for native species, there certainly could have been but little in them to tempt even the curious to experiment when they were so manifestly inferior to those from abroad.

With the larger tree-fruits, most of which have no native near relatives, foreign species must continue to be our sole dependence, but even with these we have learned to rely mainly upon varieties of American origin. Thus the apple, pear, peach, apricot, cherry, and, in the semi-tropic portions of the United States, the members of the citrus family, are all of foreign nativity, and of these (with the exception of the apple, which has a distant relative in

our American crabs), we must forever rely upon the introduced species. We can, therefore, only hope to acclimate and improve these several species by culture, the origin of new varieties and the occasional introduction of new blood from their native habitats, so as to the better adapt them to our climate and soils. Much has already been done in these directions, and much more may yet be accomplished.

SPECIES WHICH HAVE IMPROVED AND UNIMPROVED NATIVE RELATIVES.

As has already been hinted, much valuable time has been lost, as the results of the last few years will attest, by our forefathers in their efforts to acclimate certain species of foreign fruits, to culture in our climate, and especially where native relatives only awaited the results of trials. Most prominent among these is the *grape*. Prior to the publication of Downing's original volume, in 1845, absolutely nothing had been done, in a systematic manner, by way of improving our native grapes. It is true, the Catawba, Isabella, and a few others, were in cultivation, but, as Downing well and truthfully remarks, "they are accidentally improved varieties, that have sprung up in woods and fields from wild vines." But we were just then bordering on the era of improvement of our native species of grapes. As evidence of this, Downing adds to the above quotation the following: "They (these improved grapes) are, therefore, but one remove from a wild state, and, as extensive trials are now being made by various cultivators to produce new varieties from these, there is little doubt that in a few years we shall have many new native sorts, combining the good qualities of the best foreign grapes, with the hardiness of the indigenous ones, and with also the necessary adaptation to the various soils and climates of the United States." How well this prophecy has been fully verified the present large and rapidly increasing list of splendid native grapes well attests. Foreign sorts are now almost unknown and forgotten except as we meet with them in the markets, shipped from Southern Europe or from California.

These same remarks will apply to the plum, the native species of which has been so wonderfully improved within the last few years; to the raspberry, foreign sorts of which are rapidly being superseded by improved American varieties; to the strawberry; to the gooseberry; to the cranberry, etc. But there are a number of our native fruits as yet wholly neglected.

THE IMPROVEMENT OF SPECIES BY SELECTION AND CULTURE,

Which was so ably advocated and practiced in the early years of this century, by the late Dr. Van Mons, of Belgium, consists mainly in removing the natural wildling from its native habitat and transplanting it into cultivated grounds and surrounding it by all the domesticating arts of the horticulturist, always selecting specimens to propagate from which combine the greatest and most desirable qualities. This operation, repeated from generation to generation, though not really so highly scientific and certain in

its results as that of cross-fertilization and hybridization, has ever been the true basis of all successful improvements in the whole botanical kingdom. Let such work as this become the leading features of our experimental stations, to be conducted at public expense and for public good. The time and expense necessary to the most rapid progress in this work should be borne equally by all.

The marvelously rapid progress made in the improvement of our native grapes, plums, gooseberries, raspberries, strawberries, blackberries, cranberries, etc., within the life-time of many who are present, should prompt us to bring under our protecting care and influence still other native species which have equally, if not even greater, natural promise.

OUR NATIVE CRAB. (*Pyrus Coronaria.*)

I first mention this species, more because of its relationship to the king of fruits, the apple, than on account of any special promise it may possess as a hopeful species in the hands of the horticulturist, whose arts are said, and upon well attested grounds, "to mend nature." There are a few cases in which it is claimed, though somewhat doubted by botanists, that hybrids between the cultivated apple and the wild crab exist. The Soulard is one of these. If this is really true, one of the first steps in the improvement of the native crab has already been taken, and should at least greatly encourage further efforts. A serious obstacle to natural hybridization exists in the disparity of the blooming season of the two species. This may, however, be overcome by artificial means, until a race of hybrids are once established, when, assuming that their offspring may not be infertile, the work of further development can progress without interruption, since these first results would have a uniform period of blooming. But our native crabs may be improved by other means than through hybridization, viz.: by *selections* and *culture.*

THE PAPAW. (*Asimina triloba.*)

There is probably no native fruit of greater real value and more promising in its character as likely to yield readily to the domesticating influences of horticulture than the papaw, which yet remains wholly unimproved. It combines a natural disposition to vary greatly in size, quality, season of ripening, fruitfulness, etc., all pointing to the ease with which it may be trained to sport into varieties combining points of excellence adapted to the tastes of the experimenter. I am aware that all tastes do not naturally admire the peculiar qualities of the papaw, but I think there are few persons who may not readily acquire a taste for this rather singular fruit. There certainly are but few native "Hoosiers" who do not like the papaw. There is at least one venerable member of this Society who has been heard to say that he was a "lover of all fruits from a sour Morello cherry up to a papaw." The lamented Warder describes the fruit as "large, succulent, with many large, shining brown seeds; a favorite of the raccoon, relished by men, but rejected by swine."

THE PERSIMMON. (*Diospyros Virginiana.*)

Here is another native fruit, probably of even greater promise than the papaw, which still remains neglected. It has almost or quite as great natural tendencies to variation as the papaw, and the further assurance only recently made evident through the introduction, into the south, of its Asiatic relative, the Japan persimmon, that it is susceptible of a high degree of improvement. Many of us have already been assured, by personal observation, how wonderfully this Asiatic species has been perfected through the long ages in which it has been subjected to improvement. Unfortunately, this species is only hardy in the semi-tropic regions of the United States. But in our native species we have every assurance that it may be equally improved, and that it may be adapted to culture in all central, if not in northern sections of our country. Central Indiana is about the northern limit of the native persimmon, though it is possible to cultivate it wherever the hardier varieties of the peach will succeed. In some of the southern states it forms a staple article of food for man and beast. A writer, in speaking of "persimmons in Arkansas," has said that there "all living creatures rejoice and grow fat when the persimmons ripen." Our native persimmon is said to hybridize freely with the Japanese species, in the south, and that already many varieties of great promise have in this way been produced. If this be really true, we may yet hope, by the infusion of this foreign blood, to secure offspring which will combine hardiness of tree with the improved qualities of the introduced species.

THE SERVICE-BERRY. (*Amalanchier Canadensis.*)

Dr. Asa Gray enumerates several sub-species of the service, or Juneberry, as it is sometimes called. The one native to central Indiana is the arborescent, or tree-like form, readily recognized in early spring by its profusion of white flowers, and later by the swarms of robbins and boys that resort to its branches for its pleasant, agreeable and handsome fruit. I am not aware that any effort has been made to improve this fruit by cultivation. The dwarf forms, of which there are several, I believe, are not natives, especially in central Indiana, if, indeed, in any portion of the state. Some of these, however, have been cultivated, and at least partially improved. Hon. H. E. Van Deman, United States Pomologist, has cultivated a variety at his former home, in Kansas, which he speaks highly of as a valuable small fruit. Our native service, the tree-like form, is worthy of a place on the lawn, as a handsome ornamental tree, if not on account of its fruit. Let us give it a trial and see if we can not afford to adopt it into our fruit gardens.

THE HUCKLEBERRY. (*Vaccinium.*)

Notwithstanding Mr. A. S. Fuller, in his treaties on small fruits, written more than twenty years ago, devotes a chapter to the huckleberries, of which several species are native in different parts of our country, and in which he,

with particular emphasis, praises their valuable qualities, there yet seems to have been no systematic effort made looking to their domestication and improvement. Mr. Fuller says: "The huckleberry is one of those fruits which have always been neglected; none of our horticultural writers have deemed it worthy of any particular description, and but very few have thought it worthy of mention. Why this neglect I am at a loss to understand, for the huckleberry possesses naturally better qualities than even the currant and gooseberry." The wild berries are gathered and sold in immense quantities in portions of our country, where they form quite an article of trade and commerce among the poor, who bring them to market. In view of the naturally good qualities of the huckleberry, we may well repeat the inquiry of Mr. Fuller, of twenty years standing, "Why this neglect?" The species, *V. corymbosum*, seems to be the one most valuable in its native state, and probably worthy of greatest attention.

THE MULBERRY. (*Morus.*)

There is considerable horticultural literature devoted to the mulberry, but it is mostly expended upon foreign species, to the neglect of our really more valuable native species. After giving these foreigners an exhaustive trial, as we did foreign grapes, raspberries, strawberries, etc., and finding them wanting, we may discover that it is to our interest to look nearer home. Our native mulberry is quite variable in its character. They are met with occasionally that are really valuable. Aside from its fruit-bearing habits, the mulberry is a most valuable timber tree. It is of rapid growth, of handsome form and foliage, and probably the most durable timber which we can grow. It may not be quite equal (especially on account of its larger habits of growth, being, therefore, more difficult to gather the foliage from) for food for silk-worms, but there can be no doubt but first-class silk may be produced from worms, fed wholly, or in great part, upon the foliage of our native mulberry.

DISCUSSION ON MR. RAGAN'S PAPER.

Mr. Smith, of Wisconsin—What kind of huckleberry is referred to?

Mr. Ragan, of Indiana—There are several species of the huckleberry family (*Vaccinium*) which are good. I believe *Vaccinium corymbosum* is generally conceded to have the most good qualities.

Mr. Van Deman, of Washington, D. C.—What is known in the Alleghany mountain region as the blueberry (*V. Pennsylvanicum*) is one of the most valuable species. This and also the dwarf service-berry, alluded to in the paper, are undergoing the process of domestication and improvement.

Mr. Ohmer, of Ohio—I have the service-berry in cultivation, and we think a great deal of it, although the robins insist upon taking their share.

Prof. Budd, of Iowa—This is a favorable locality to experiment with native fruits. Cross-fertilization is the safest and surest method of improving our wild fruits. The paper cites many instances of the efficiency of this method of improving our native fruits.

A vote of thanks was tendered Secretary Ragan for his valuable paper.

The citizens of Riverside having arranged for a carriage drive for the forenoon of to-morrow, the Society adjourned to meet at 2 o'clock P. M.

Fifth Day—Wednesday.

AFTERNOON SESSION, February 8, 1888.

The Society re-assembled at 2 P. M., President Earle in the chair.

DEATH OF H. Y. BEEBE.

The President read the following letter:

Friend Ragan: TALLMADGE, OHIO, February 1, 1888.

I had planned to leave to-night for Riverside, but am unable to do so. You will doubtless be pained to learn that H. Y. Beebe died on the 29th and was buried to-day. I have just returned from the funeral. In his death, and that of Mr. Kendel, horticulture and the American Society have lost two tried and staunch friends. Mr. B. was active and useful almost to the day of his death, and few men have so rounded out the full measure of usefulness as did he.

With kind regards to all friends, I remain, yours very truly,

L. B. PIERCE.

President Earle—This is, indeed, painful news to us. Friend Beebe was one of our true and tried members.

Mr. King, of Ohio—This is sad news to me. I hail from the same neighborhood in which Mr. Beebe had so long lived, and in which he was so highly esteemed as a citizen. His virtues were great, his faults few.

President Earle read the following paper on forestry:

WHAT SHOULD THE STATE AND NATIONAL GOVERNMENTS DO FOR FORESTRY?

BY B. E. FERNOW, CHIEF OF FORESTRY DIVISION, WASHINGTON, D. C.

Your Secretary has called for short papers, but your worthy President has proposed such a long title and so broad a subject for me that I have found it difficult to be brief and yet tolerably exhaustive. To attempt to compress the subject into small space has necessitated that I should forego many valuable arguments, and has obliged me to state simply in terse sentences and in dogmatic form the basis of forest legislation.

Before we discuss particular legislation we must agree, *First*, that legislation, national or state, is not designed to adjust merely matters of to day, but must often work with an eye to the future. *Secondly*, that legislation is necessary whenever opposing private interests are not strong enough to so mutually balance each other as to produce a natural adjustment; that is to say, whenever the interests of the few lead to detriment, material or otherwise, for the many, for the community at large in the present or the future. And we must also ascertain whether the time for state interference in any particular case has arrived, *i. e.*, whether the selfish greediness which characterizes the majority of single individuals in their economic relations has gone so far as to make defense of the communal interests a necessity.

Forest legislation naturally has reference either to the forest areas which we find ready for use, a product of nature like mines and agricultural fertility, or to such forest areas as we may artificially produce.

As simple sources of national wealth, the forests, it is asserted, can claim no more, although certainly as much, recognition by legislature than mines, for instance. Indeed, forests might well be compared to the latter were it not that the forest resources are more limited, and, therefore, must become exhausted within a comparatively short period in the existence of the nation, and that they are capable of reproduction by human effort. The forestry interests may, perhaps, be best compared with the fishery interests of a country, both being gifts of nature liable to be exhaused by the wasteful use of man.

Considering the *material* aspect of this source of wealth, at a rough estimate, the position of the forest resources of this country at present is about as follows: The annual consumption of wood products must be considerably above 20,000,000,000 cubic feet, while the area from which this is drawn is considerably less than 500,000,000 acres, and owing to the lack of attention to the matter of reproduction, and the ravages of fire and cattle everywhere prevailing, the annual growth can hardly be half our annual production. This last conclusion we reach by comparing our forest conditions with those of a country like Germany, which, with careful management and favorable conditions for wood growth in all parts, produces on an average not more than fifty cubic feet per acre per year.

The *financial* aspect of this source of wealth may be stated thus: The present annual market value of forest products at primary points of production exceeds $1,000,000,000, viz., in round figures, not less than $500,000,000 for saw-lumber, $100,000,000 for railroad construction, $50,000,000 for fence material. Smaller wood-consuming manufactures demand a raw product of $10,000,000, fuel consumes $600,000,000, and naval stores over $5,000,000. The exports of wood and wood manufactures have lately ranged from $30,000,000 to $40,000,000; the imports from $12,000,000 to $16,000,000.

It appears that there is no product in the country which compares in magnitude of annual value to that of the forest. For if compared with agricultural products, of which one or two seem to equal or exceed the wood production, it must not be overlooked that in making up the value of forest products no cost of production is charged, only cost of harvesting and preparing for market the raw material, and to some extent soil rent. If we had to add the cost of producing the lumber by artificial forestry, as we shall have to in time, the values of agriculture and forest products would be more nearly comparable. Compared with the values of mineral production, although the present year's output is enormous, yet the forest products yield from two and one-half to three times as great a value.

If we inquire into the condition of forest areas and into the methods by which the products are obtained, we find that there is but a comparatively small part remaining which has not been cut over; that in the eastern, northern and central portions of the country the most valuable timber has been removed; that almost nowhere is any regard paid to keeping fire out of old or new growths; that the young natural growth is mostly inferior in value, on account of neglect; that on large areas no reproduction of value takes place; that on account of ignorance as to the qualities and adaptations of various timbers, but still more on account of enormous competition, speculation and other avoidable or unavoidable causes, a frightful waste of raw material is going on, so much so that it would not be an overstatement to say that, under present conditions, at least twice as many trees are cut as would suffice for the same wood production.

Thus we see that merely as an important factor of national wealth, which is being immoderately consumed, the question of lumber and wood supply should attract the interest and possibly call for the activity of communities and states, so as to insure a regular lasting supply of one of the most useful staples.

The function of the state in influencing industrial activity is still a matter of controversy, and while, if a serious detriment threaten the interest of the community owing to the neglect of any industry, the community should be justified in taking measures against such detriment, just as we take precautions against detriment from other sources, it might be argued that industries are apt to take care of themselves under the influence of the law of supply and demand, and that private interests will be sufficient to guard against any but temporary injuries. While this may be quite true with re-

gard to industries the material of which is capable of yearly production and ready adjustments of supply and demand, especially when a knowledge of over or under production is easily obtained, the forestry industry is not to be compared with any of these.

Its essential differences are, that the crop takes from twenty-five to one hundred and fifty years to become useful; that such long waiting for results is not a feature inviting private investment; that during the long time of probation accumulative risks to the investment are threating; that the possibility of utilizing the crop sooner or later will always tend to induce realization as early as possible and therefore keep the supply of heavier material short. Lastly, a knowledge of the conditions of supply—or crop area if you please—is more difficult, almost impossible, to obtain by private effort, although the demand may be to a more definite extent determined. In short, the scale which balances the supply and demand of forest products adjusts itself so sluggishly that application of this economic law of adjustment may be very beautiful in theory, but must in practice appear of problematical effect, and therefore a strong incentive for the community exists to supply additional weights, which will hasten the adjustment of the balance.

While then, as an industry, forestry stands in more need of government care than any other, the strongest claim for such care comes from the fact that forest areas in certain positions have an undeniable influence upon agricultural, and, before you I should add, horticultural conditions. So much has been said under this head that I take it for granted that at least the influence which the mountain forest exercises on equalization of waterflow and the forest of the plains on the severity and force of winds, is well understood.

In this respect at least, if in no other, the forests are distinguished broadly from any other form of natural wealth; and in this respect even the advocate of individual self-direction will not expect reliance to be placed on private citizens to so use their forest property as to serve this special function of it, in which his neighbors may have much more interest than the owner himself. Indeed the history of all countries, not alone that of our own, has shown that private interest can not be so relied upon; that forest destruction and devastation is the only consequence of such reliance; that private and financial interests alone can be expected to control the action of private owners.

Such considerations, while existing in the eastern states to some extent, are most potent for the mountain forests of the western part of United States, notably, the Rocky mountains and the Pacific slope. I can not stop here to describe the present conditions of these, or to enlarge upon the folly with which they are squandered, nor to outline the legislation which the national government should enact in regard to them. This I have done in a separate paper. Suffice it to say that until this valuable forest property has received that attention on the part of the legislators which will insure its rational use, it is preposterous to speak of any other national legislation in behalf of forestry.

Aside from this legislation, which places the timber lands of the nation under a forest administration, and the natural consequences which might culminate in the establishment of a national school of forestry, and in the planting to forests of the abandoned military reservations, the rest is best done by the several states. The time has come for *every* state to make a beginning in rational forest legislation, for those which have still large forest areas of virgin timber, as well as for those who have their forest wealth reduced to coppice and second growth, or, worse to useless brushwoods, and for those who have to plant their first forests.

No state can afford to-day to be without an energetic forest commissioner or forestry commission, or somebody charged especially with the care of her forestry interests. With such an office established and suitably provided for, I have hopes that threatening dangers may still be averted, and that reasonable measures may be effectively applied which will lead to a recognition of the self-protective interest which the community has in the forest areas. The first legislation then is for protection of what we have. Protection against fire is needed more than anything else. Though most states have some such legislation, but few have satisfactory and effective laws, and hardly any the machinery to put them into practice. To provide such machinery is the most important point in all legislation. With a forest commissioner to look after the execution of the law, desirable effects can be expected from either the Massachusetts, Pennsylvania or Canada plan for dealing with forest fires, described elsewhere. These plans, which call for the coöperation of the community in an organized manner, can be set in operation in every state without involving any new ideas of state interference.

In some localities the forest cover is of such importance that its removal, or even deterioration, brings, in time, hardships upon large districts which depend for the regularity of their water supply upon such forests. Here enters a new aspect of legislation, for which there seems to be no precedent, unless we can find one in the control of waters and roads, in which the higher rights of the community allow interference with private rights. Such localities, however, are not very frequent except in mountain districts. Mountain forests such as have been described, must either be owned by the state, community or county or else their interference in the manner of utilizing the same is called for.

A state law which will encourage the holding of forest areas by townships or counties, and their administration under direction of the forestry commission or commissioners, is highly desirable. There is no reason why a township or county should not own and manage a forest, when it is in the interest of the community to so own forest property, just as they own and build roads, bridges and school-houses, or as a city owns its municipal buildings and other property. Next to such direct forest legislation, much can be done indirectly, and in this the most important step is to dispel ignorance—ignorance as to supply and demand; ignorance as to technical value of different timbers, as to value of forests in general; ignorance as to the man-

ner in which the natural forests ought to be treated in order to give a continuous supply of the best material; ignorance as to the manner of planting new forests.

To some extent the Forestry Division of the National Department of Agriculture, instituted partly for this purpose, answers to this need; but it might be better equipped, and, after all, it will be necessary for each state to supplement and aid its work. Among the simplest and most easily accomplished institutions to that end. I propose that each state make an annual or biennial report of its forest area and the conditions of the same, and of its lumber business up to date. These details might be gathered by tax assessors under instructions from the forest commissioner or commission, and, together with other statistics, be digested by the latter, with the view of keeping an approximate idea of supply and demand before the public.

Further, the state agricultural experiment stations, being endowed by the general government, should institute, in connection and under advisement with the forestry division or the state forest commissioner, such laboratory and field experiments as are needed to show the true value of timbers, to show the dependence of their quality on the particular factors of site, to ascertain their rate of growth, and other laws upon which a forest management must be based.

Another method by which state legislation can dispel ignorance is by endowing either forestry associations, or, in their absence, the horticultural associations for active forestry work, in the same manner as the state horticultural associations are now endowed. The collecting and distribution of information may be accomplished through the aid of such associations. The Kansas Horticultural Society is a shining example of what may be done in this direction. If a wandering lecturer could be employed in addition, to arouse to intelligent action and instruct the people in forest management and forest culture, we might soon register as good results as this institution has brought in Switzerland.

I do not consider forestry schools to be called for as yet, but every agricultural college, to be worthy of its name, should have a course in forestry as one of the branches of soil culture. A national forestry school, for the education of the officers of the proposed National Forestry Department, based somewhat on the pattern of the military schools, may become desirable when such department is instituted.

There still remains to be considered the legislation of direct encouragement to tree-planting. This is the last to be attempted, the most difficult to devise and to execute, but by no means impossible. Such laws should not be enacted until the importance of forestry as a business has been fully recognized, and we are willing to make adequate efforts, and until the proper machinery to guard against misappropriation of such encouragement is provided. A release from taxation, or a bounty to the extent of a few pennies or a few dollars as some states have enacted, is no encouragement. Such

must be of a more substantial character. Nor do I believe in dispensing charities where fair bargains are possible.

The community is not only richer than the private man, but it is longer lived, and can more conveniently wait for returns. Let, wherever public interest should demand afforestation, the community plant the forest, taking a lien upon it for the repayment of its loan, with the same rights which pertain to any other lien or mortgage, the latter not to fall due until the full crop is ready to be utilized, when principal and interest may be satisfied. The distribution of seeds and seedlings from nurseries under contract can also be made of service, either free of cost or at nominal charges; but we must not expect much encouragement from the peddling out of a few plants or ounces of seed, when acres are to be planted.

While little Prussia, with a model forest administration and largely satisfactory private forest management, being not larger than three quarters of the area of California, found it advantageous last lear to distribute over 38,000,000 seedlings (mostly conifers) free of charge, and 25,000 pounds of seed at nominal prices, the Department of Agriculture of the United States is not sufficiently endowed to devote more than perhaps $500 to the same purpose, and for the entire forestry interest of the nation it spends about one-fifth of what little Prussia appropriates for the purpose of forestry schools and forest experiment stations alone. No wonder that in ten years of forestry investigations we have accomplished nothing, practically. It can not be the pocket that dictates such niggardliness. Is the heart or the intelligence lacking to deal more wisely with this great interest?

Of all these various directions of legislations proposed, not every one may be found desirable or needed in each state, but I would insist that besides efficient protection against fire nothing of a limited nature is so full of promise as the creation of a forest commissioner in each state—a salaried officer, with facilities to gather and impart information, and to represent the forestry interest in the execution of laws. The small expenditure of two or three thousand dollars, which this would call for, will be returned a thousandfold in the fostering care which an intelligent community would learn to bestow upon this great forestry interest.

President Earle—We have another paper on this most important subject, which Mr. Kinney, of California will now read in your hearing:

THOUGHTS ON FORESTRY IN CALIFORNIA.

BY ROBERT DOUGLAS, OF ILLINOIS.

The legislature of the state of California has granted an appropriation for the establishment of experimental stations, for testing fruit, ornamental and forest trees. This experimental work can not be commenced too soon, for while individual enterprise has been employed in thoroughly experi-

menting with every kind of fruit, to an extent which is simply wonderful, the noble indigenous trees of the state have been sadly neglected. Indeed, with the exception of a few noble specimens in the capitol grounds at Sacramento, we rarely find a specimen, except *Cupressus macrocarpa* and *Pinus insignis* (the Monterey pine and Monterey cypress), planted everywhere, while specimens of *Sequoia gigantea*, *S. sempervirens*, *Cupressus Lawsoniana*, *C. Goveniana*, *Thuja gigantea*, *Libocedrus decurrens*, *Pseudotsuga Douglasii*, *Abies Menziesii*, *Picea litchensis* of Engl., *Abies concolor*, and other noble silver firs and nobler pines, are rarely to be met with.

Forestry is a subject of great importance to this state, and the time will soon arrive when it can not longer be neglected. The conditions here differ so materially from the Atlantic slope that our experience will not avail to any great extent here. Forestry here must be confined mainly to desert and hilly lands that can not be irrigated. A transient visitor from the east, looking from the window of a sleeping-car, would see a very discouraging prospect. The desert is certainly not promising to him, and the hills look little better.

This word *desert* is not well understood. Many agriculturists and horticulturists in Kansas and Nebraska claim that they have brought their land from a desert to rich, fertile land within two or three decades. They tell you that their states are a part of the great American desert, and refer you to a school geography to prove what they say, but they do not seem to notice the fact that in this same school-book there are wood-cuts of Indians chasing immense herds of buffaloes, wading through very tall grass. When the emigration of 1849 went through the territory of which Kansas and Nebraska is now a part—and that was before there was a white settler in the territory—the land lying between the Missouri river and the Rocky mountains was called the plains. The desert of the "forty-niners" lay between the sink of the Humboldt and the Sierra Nevada mountains, and many years previous to that time, the Santa Fé traders crossed the plains from Leavenworth to Santa Fé. The settlers in Kansas and Nebraska claim that they can grow cultivated crops where they could not be grown twenty-five years ago. This is undoubtedly true, and can be readily accounted for.

Before the whites settled west of the Missouri river, the land through central Kansas and Nebraska was covered with buffalo grass, which kept the rains from penetrating the ground almost as effectually as would a shingled roof. I have run my cane into the ground a few minutes after it had been flooded with rain, and found it dry as dust two inches from the surface. The rain ran off in torrents into the ravines and draws, without having a perceptible effect except on the surface. You might see the plains covered with water, looking like a lake with many islands, and within two hours from that time, scarcely a sign that there had been any rain at all. Since that time millions of acres have been plowed in Kansas and Nebraska, and, aside from this, 147,000 acres have been planted with forest trees in Kansas (aside from a large number planted last year), and a great many more have been planted in Nebraska than in Kansas.

Now, when we consider that an inch of rain is equal to 100 tons of water per acre, and multiply the millions of acres of plowed land by the number of inches or hundreds of tons that have been absorbed in the plowing, which formerly ran off, we can see that the settlers have materially changed the conditions of the plains.

While your desert lands look very unpromising to the tourist, even when compared with the plains, the close observer will see many things aside from climate in your favor. Any one studying these deserts carefully will see that lying neglected they must be gradually growing drier and drier. This is plain to be seen. We see where deep lakes once overflowed, no water stands now; where monstrous trees once grew, as shown in the petrified forests, only pigmies, in comparison, grow there now. We see that the channels of the streams are generally being cut deeper, which, of course, drains the country more rapidly. We now and then see an article, very prettily written, attempting to show that the iron bands laid across the continent produce electricity and increase the rain-fall. Unfortunately, I can not explain to you just how this is done; neither can the writers of these articles. I certainly think that the railroads have had a wonderful effect in increasing the intelligence of the settlers. It is apparent to any one who has traveled over the country to any great extent, that the people living along the line of a railroad improve in intelligence more rapidly than those living twenty or more miles distant. Railroads are good educators and civilizers, but I did not suppose, until I crossed the Central Pacific last summer, that the railroads are educators of the Indians as well as of the whites. I was surprised to see the Indians, along the line of the road, in the vicinity of the Humboldt river, looking strong and healthy and decently clad. Indeed, some of the young men were dudes in their way—dressed in modern citizens' clothes, high-heeled, calf-skin boots, a sombrero and fancy Mexican blanket. I had not time to inquire into their general intelligence, neither did I think to inquire into their political proclivities, but judging from the way they put on airs, I concluded that they must be mugwumps. I had traveled through this same territory many years ago, and could not help drawing a comparison between the Indians as they were then and as they are now.

Although a trifle less than forty years had elapsed, yet the contrast was very striking. I did not see them in any great numbers at that time, and we supposed that the better part of them kept away from the emigrant trail, but those I did see were a cadaverous, half-starved looking lot, living on large black crickets, kneaded into pounded green vegetable matter, resembling wheat just at the time it is heading out. Their apparel consisted of a thick, matted head of hair and a cloth around their loins; but this was only when they were in full dress, as there were some exceptions where they seemed to have sent their whole wardrobe to the laundry.

Although I have not had the opportunities for studying tree growth on this side of the continent that I have had on the other side, I have yet seen some very encouraging signs. I have seen changes recently in parts of the

country I went over in 1849 that are well worth noting, and give great promise even on what were then desert lands, pure and simple. On the other hand, I have carefully observed, especially in one or two cases, that among millions of trees, covering miles on the side of a desert, I couldn't find a single tree less than fifty to seventy-five years old, although these trees are covered with seeds, and there are no indications of a fire ever having visited them. This is proof to my mind that the climate is drier, as seeds can not germinate now where they produced seedlings less than a century ago.

Any one who has studied these desert lands, even when on a flying trip, will see enough to convince him that if irrigation could be secured there would be very little desert land in this state. I firmly believe that on any desert land where sage-brush and other shrubs are growing, even sparsely, forest trees will grow, if the land is cleared and well plowed, which is a very cheap and simple affair compared either with clearing grub land, timber land, or breaking prairie in the eastern states. The forest trees must be planted during the rainy season, and cultivated at least during the succeeding season. It is surprising to see how the land in this state endures drought, when compared with similar land on the other side of the continent. I have seen our gravelly land in Illinois without apparent moisture at three feet in depth, after a drought of only six weeks. I have noticed men digging only two feet deep for telephone poles in this state, and the moisture was perceptible, although there had been no rain for nearly six months! This is not a solitary case, but is usual, as I have frequently noticed in new railroad cuts.

In the east a hard-pan lies at a certain depth below the surface, through which the moisture can not be brought up by capillary attraction. In this state the soil generally is loose and porous down to the bed-rock, however deep that may be, consequently all the deciduous fruits may be grown without irrigation, but they must be thoroughly cultivated to get the best results. All through the San Gabriel valley, and in other parts of the state that I have visited, the indigenous trees thrive best on the north sides of the hills. Indeed, they are generally destitute of tree growth on their southern sides; only shrubs, perennial and annual plants, and a scanty growth at that. Yet I have seen eucalyptus growing where planted on the very summits of some of these hills, and also on the south sides. In very many of these hills the soil is quite rich enough for tree growth even to the very summit; indeed, I do not remember an exception, except where the rock protruded.

As to irrigation, I touched that subject very modestly for awhile, as I received quite a rebuff the first time I ventured an opinion. A gentleman was irrigating a very fine auraicaria. He had the earth scraped away from the collar of the tree, forming a basin about three feet in diameter and six inches deep. He was flooding this with cold water in the heat of the day, and threw the water with such force from the hose that the crown of the roots was laid bare. I told him I thought he ought not to disturb the sur-

face so near to the trunk of the tree, as the feeding roots lay at some distance. He told me that the Mexicans had irrigated for a hundred years, and he guessed they knew more about it than a newcomer. I pocketed the affront, and asked him how long he had lived in the state. He said over two years; then I wondered he had not called me a tender-foot. I have always found the old settlers very civil and kind, and ready to answer all questions freely. I never saw more obliging people anywhere. No doubt a great deal has been learned from the Mexicans, yet I think our people can soon make improvements on what they learn from them. I had the curiosity to go quite a distance from the road near Santa Fé to see a Mexican plowing with a wooden plow. He was doing it very well considering the implement he was using, yet I could not help thinking that the work could be done better with a light steel plow, and much easier, both for the donkey at the beam and the one at the handles.

The more I observe and study this desert question the more I become convinced that progress will be made in this direction much more rapidly than the most sanguine can imagine. Scientists may attempt to prove to you that according to natural laws the thing is impossible. Less than fifty years ago scientists said and wrote that valuable trees could not be grown on the Illinois prairies until many generations of willows and poplars were grown to fit the land for the more valuable kinds, and at that time it was the general belief of prairie farmers that trees and the tame grasses would never succeed on prairie lands. Now we know, and have long known, that our prairies grow every kind of tree and grass that will bear the severity of our climate. You will make much more rapid advances than we made in the Mississippi valley. Our settlers came in covered wagons; yours come on express trains. You have improved labor-saving machinery, which was not then invented, and last, but not least, you have a staple currency, and are not left to the mercy of wild-cat banks.

Reservoirs will be built to husband the waters that are now running down the rivers into the ocean; artesian wells will be used in many places; thousands of acres of forests will be planted, that will not grow as rapidly as if irrigated, but after they are planted and cultivated the earth will absorb a great quantity of water that formerly ran off; the trees will shade the ground, which will gain both in moisture and fertility, as they will draw nutriment from an immense depth, while our forests draw their nutriment from nearer the surface. The eastern farmer and horticulturist has at best only seven or eight months in the year, and from this must provide enough to support his family, secure fuel, and feed for his stock. Aside from this, his land is decreasing in fertility, or kept fertile at great expense and labor, while yours will for a long time be increasing in fertility if kept well cultivated and worked deep.

It will require more experience than any of us have had to decide which will be the most suitable trees for forest planting. Many of the most profitable for eastern planting would not succeed well here. The soft foliage of

the white pine and the larch would unfit them for this climate; also, the tendency to run their roots near the surface of the ground would be to their disadvantage. For desert planting trees must be used that can be grown cheaply from seeds, so as to come within the means of the new settlers. This would seem to be a necessity. I would place *Eucalyptus globulus* at the front, as I have seen it growing in what would seem almost impossible places. It would make fuel cheaper than any other tree that could be grown on like lands. The common locust, *Robinia pseudacacia*, I have seen growing well in Western Kansas and Nebraska, New Mexico, Colorado, Utah, Nevada, and at several places in this state, in every case making a good growth without irrigation, and in all these cases I have failed to find traces of the borer, so fatal to this tree in the eastern states. Would space admit, I might name other trees I would deem as promising well. These two, however, will furnish fuel and durable posts for the new settler, are grown very cheaply from seeds, and transplant well.

For general forest planting there are two valuable trees that stand out in bold relief. In their case there can be no mistake, for nature has succeeded in growing them almost everywhere between the eastern base of the Rocky mountains and the Pacific coast, and man has used them more generally than any other trees over the whole western half of the continent—*Pinus ponderosa* and *Pseudotsuga Douglasii*, or Douglas spruce. The former, *Pinus ponderosa*, ranges all through the mountains from British Columbia down into Mexico, through Arizona and New Mexico to Western Texas, growing on dry mountain-sides through Colorado and Montana. It forms over 90 per cent. of all the timber in the Black hills of Dakota, reaches further out on the plains than any other tree in Colorado, and is the only western coast tree that runs east into Nebraska. Sargent says: "Next to the Douglas spruce, it is the most generally distributed and valuable tree of the Pacific forests." The Douglas spruce ranges through British Columbia, Oregon, Washington Territory, all through the Sierra Nevada, the San Bernardino mountains, Arizona, New Mexico, and on high dry ridges in Colorado, through the Uintah and Wasatch mountains, and in Wyoming and Montana. Sargent says: "It is called yellow or red fir by lumbermen; is more generally distributed and said to be the most valuable timber tree on the Pacific coast." This tree grows on high dry ridges in Colorado, Arizona and Montana, which proves it to be, like *ponderosa*, a suitable tree for planting on dry lands. Like *P. ponderosa*, it is a rapid grower, and reaches to the largest size. These two trees furnish nearly all the merchantable lumber, except redwood, from the coast to the eastern base of the Rocky mountains.

The *Sequoia sempervirens*, redwood, is a valuable tree, but only adapted to certain localities. It has a very circumscribed range, only reaching from about the northern line of the state to the southern boundary of Monterey county, and in a narrow belt along the coast. Experiments may prove that this valuable tree will succeed far from its present locality. I noticed a fine specimen on Dr. Cares' grounds in Pasadena, eight years planted, and over

thirty feet high; also, specimens on the capital grounds much higher. *Pinus insignis*, although its timber is of no great value, may be named as having a very limited range—only found in a sandy spot at a single point on the coast—yet we see it growing well wherever planted. We may hope from this fact that others of limited range and more value may have their limits extended under cultivation.

DISCUSSION, RESOLUTIONS AND REPORTS ON FORESTRY.

Mr. T. H. Douglas, of Illinois—How does the black locust succeed in California?

Prof. Klee, of California—It succeeds very well in many places in this state, and is nowhere subject to the attack of the borer, though it is a dangerous tree to cultivate on account of its breeding and propagating the white scale. On this account it should be carefully avoided, as the scale passes from it into our orchards.

Dr. Plummer, of Oregon—The locust does well in our state. It is not subject to the borer nor the scale, which we hope our California brethren will keep on their side of the line.

Mr. Lewers, of Nevada—The locust does well with us, and is free from all kinds of insects.

Prof. Klee—The eucalypti, of which we have a number of species, all introduced from Australia, do well in California. Some are, however, much more hardy and valuable than others. They require but little water and are rapid growers. The redwood (*Sequoia sempervirens*), and its relative, the big trees (*S. gigantea*), although confined by nature to narrow limits, are, in my judgment, susceptible of pretty extended culture in California. This is especially true of the redwood, which is an exceedingly valuable tree wherever it can be grown.

Prof. Budd, of Iowa—The locust is an American tree, which was introduced into Europe about a century ago, where it flourishes and has spread all over the continent. It is a most valuable tree both in Europe and at home. The Rocky mountain juniper I highly recommend as a very hardy tree, and well adapted to the climate of California. It requires very little water, and is valuable for firewood. The fact that it is now growing extensively on the Mojave desert is evidence of its ultimate success. It is a fact that the mountains in California are rapidly being stripped of their timber.

I consider that this will do an inestimable damage to the country. It will affect the climate and the water supply. The snows will not be preserved in summer, but will go off in early spring. Already I have been told the effect of forest cutting and destruction is sadly felt at the head of the Sacramento, and in the Sacramento and Santa Clara valleys.

Mr. Munson, of Texas—There is no tree that withstands the droughts and suddenly varying temperature of Western Texas better than the yellow cedar. It is a good grower, and valuable for fuel and other purposes.

Mr. Cutter, of California—We of Southern California realize how valuable to us are the mountain reservoirs of snow and water. Take these from us, and our fine valleys go back to a desert condition again. The native mountain timber is the preserver of these water supplies. We look with alarm upon the present tendency to strip off the mountain forests. If the present duty on foreign lumber was taken off, it would tend to cheapen this staple commodity, and thus take away the temptation to destroy our native forests.

Mr. Kinney, of California—I am glad Mr. Cutter has again brought up this tariff question, for it affords me an opportunity to offer the following resolution:

Resolved, That it is the sense of the American Horticultural Society that no question of a political character should be considered at its meetings, and that, therefore, the political resolution on the tariff, introduced at San José by Mr. Estee, be stricken from the records of the Society.

On motion of Mr. Ragan, of Indiana, the resolution was laid on the table.

Secretary Ragan—Reverting again to the question of forestry, I would say that I am glad the subject has been so ably presented by these two papers. I am especially pleased with the paper by Mr. Douglas. Twenty years ago I had occasion to refer to its author as the venerable Robert Douglas. This paper gives abundant evidence that time has not yet blunted his incisive wit and keen intellect. We are pleased to renew our former acquaintance with this leading light in the work of forestry reform.

Hon. Abbott Kinney, chairman of the State Board of Forestry.

of California, made the following report as to the condition of the work of that body:

The board is now engaged upon a forest map of the state of California. This map is being prepared by the engineer of the board. It is founded on an accurate survey with section lines. The timber on each section is marked and described, so that any one by a glance at the map can obtain scientific information as to the forests of the state. Accompanying the map there is a full account of the timber and lumber value of the different trees. Prof. Lemmon and his wife are preparing a scientific and popular account of the forest trees of the state, and with it colored drawings of the foliage, flowers and seeds, with a section of the wood of each tree, so that even those unfamiliar with botany can go into the woods and recognize each tree. The board also has established several experimental stations, where a record will be kept of each tree grown and distributed. Thus planters of trees can act more intelligently than is now the case. The board's special agents, under Mr. Ed. Collins, have been active in attempting to prevent the present robbery, waste and destruction of the forests of California. Many cases have been reported to the proper authorities, and a number of arrests of fire-setters have been made. The board regrets the necessity of reporting that, under our present laws and absence of practicable means for managing our forests, no efficient action in protecting the public forests is practicable.

A lengthy discussion on the subject of forestry ensued, participated in by a number of gentlemen, all of whom recognized the importance of the theme. In this connection, Mr. Bradbury, of California, introduced the following preamble and resolutions, which were, on motion, referred to the Committee on Forestry:

WHEREAS, The natural relations existing between the forests and all the complex interests of civilized society are vital and inseparable, and the conservation of the one is a necessary condition of the higher evolution, if not the very existence, of the other, therefore,

Resolved, That the state, in the exercise of its ultimate powers of eminent domain, is vested with the constitutional right, and is charged with the corresponding duty, to maintain within reasonable limitations a restrictive as well as fostering supervision over timber lands in the hands of private individuals and corporate bodies, as well as those belonging to the public domain. Therefore, further

Resolved, That, in view of the incalculable public evils which must result from the rapid deforestation of the whole country now in progress, it is the imperative duty of the general and state governments of the United States to provide at once, by such legislation as shall fully and seasonably meet the exigencies of the public interests, for the prevention of unnecessary and wanton destruction of all forests, whether under public or private ownership and control.

In due time, the committee, through its chairman, Mr. Kinney, of California, submitted the following

REPORT OF THE STANDING COMMITTEE ON FORESTRY:

Your committee has carefully considered the resolutions of Mr. Bradbury referred to it. These resolutions contemplate a wide extension of the theory of eminent domain hitherto accepted in this country. While we are indisposed to so suddenly indorse a radical departure of this kind, we are, nevertheless, in this case constrained to recommend the adoption of these resolutions. We do this upon the ground that the present private holdings of vast areas of our forests situated upon water-sheds, whose integrity is of vital importance to communities near them, both to secure a supply of permanent springs and streams, and the prevention of the origin of destructive floods and torrents, to say nothing of a continued future supply of lumber and the general preservation of the equability of the climate, places these communities at the mercy, as to their very existence, of private persons. We further recognize that the remaining government lands in timber are being so rapidly taken up and purchased that we must anticipate that, before a bill can be passed by congress to withdraw these remaining lands from sale, a great part of them will have passed into private hands. Consequently, without some supervision over such of this private property as is necessary to be maintained in forest for the welfare of the community, the existence of considerable population and great interests will be endangered for paltry benefits, or placed at the risk of ignorant or careless management of such forest domain.

We are encouraged to think this conclusion to recommend the passage of these resolutions is correct, from the fact that already every important continental nation has found such control absolutely necessary for the welfare of the whole people. We believe, further, that an intelligent control of all forests would add to the profits of private holdings of such property. The agricultural decay, and consequent decrease in population, of nations that have not cared for their forests is before us, and we are convinced that the extension of government control over private forests is essential to the welfare of the people.

ABBOTT KINNEY, *Chairman.*

The report of the committee, after careful consideration, was adopted.

Major Lauck, of the Southern Pacific Railway, in behalf of the Atchison, Topeka & Santa Fé Railway and citizens of San Diego, extended an invitation to the Society to visit that city at the conclusion of its sessions here, which invitation was accepted.* Major Lauck further stated, on taking leave of the Society, that he had had the pleasure of being the guide of the Society during nearly their entire trip in California, and he highly appreciated the ac-

* See Dr. Ridpath's report of excursion to San Diego.

quaintances he had made. Never had he met such whole-souled gentlemen. He assured them he would never forget them, and in all their journeys and undertakings might the blessings of God be with them.

ELECTION OF OFFICERS.

Prof. Thomas, of Arkansas, from the Committee on Nominations, reported, recommending the re-election of President Earle, Vice-President Munson, Secretary Ragan, and Treasurer Evans, which motion was adopted and the above named gentlemen duly elected. The same committee recommended the election of one Vice-President for each of the states, territories and provinces within the jurisdiction of the Society, which was also concurred in. (See list of officers.)

Invitations from San Bernardino, Lugonia and Redlands, requesting the Society to visit those places, were received and accepted, after which the Society adjourned to meet at 7:30 P. M.

Fifth Day—Wednesday.

EVENING SESSION.

At 7:30 P. M. the Society reassembled.

President Earle, of Illinois—Several years ago some prominent citizens of the north and west became interested in the question of procuring hardier varieties of fruits for the rigorous climate of the states and provinces in which they lived. With a view to informing themselves about the possibilities of northern fruits, they visited Russia and other European countries, and after extended observations in those frigid regions they returned, bringing with them a mass of practical knowledge as valuable as it was new to the American people. Chief among those engaged in making these foreign observations, and in transmitting to us the results of the same, were Prof. J. L. Budd, of Iowa, and Charles Gibb, Esq., of Abbottsford, Quebec. Prof. Budd is with us this evening, and has agreed to give us a lecture on his trip.

DOWN THE VOLGA.

BY PROF. J. L. BUDD, OF IOWA.

If not dignified with the title of lecture, a few notes from personal observation on the scenery, cities, people and commerce of the Volga river may have some interest. This great drainage center is navigable for steamers to Tver, 2,150 miles above its inflow into the Caspian. Tourists who can not give more than six weeks to a study of this ancient highway of commerce will do well to approach the river by way of Moscow, reaching Nizhni-Novgorod about the 20th of August, when the great fair is fully stocked with the varied and peculiar products of the far east, and its strange medley of a quarter of a million of the merchants and traders of the Orient and the Occident.

We alight from the cars at Nizhni, on the edge of the fair grounds, on the west banks of the Volga, and at once observe that the city is built on the bluffs on the opposite bank of the stream. We had been told that we would gain time by first taking a bird's-eye view of the city, the fair grounds, and the far-reaching valleys of the Volga and Oka, which here unite, from the highest point of the bluffs back of the city. From this elevation of over 700 feet the clear air of this interior steppe region permits an extended panoramic view that will long linger in memory.

Our attention from this point is first directed to the forest of masts and smoke-stacks of steamers, intermingled with quaint barges, which cover the waters of the Oka and Volga as far as the vision can extend. The eyes next linger on the hundreds of steamers, vessels and barges, packed in like sardines in a box, along the ten miles of wharfage of the fair grounds on the borders of the two rivers. With the field-glasses at hand, even the faces and the rags of the Tartar laborers who are discharging the queer cargoes may be plainly seen.

Back of the wharfs the rows of trading bazaars of the fair grounds extend across the level plain from river to river, and extend westward as far as the vision extends. Our deep interest in the river scenes, the great extent and queer expression of the fair grounds, and the back setting to the north and south of harvest fields, dotted with forests, villages and gardens, is such that we quite forget to take a glance at the strange oriental city spread out on the bluffs below us. When we come to this part of the picture, the gilded domes and gaudily painted towers of the forty-nine cathedrals first engage our attention. As to the expression of the domes, we can compare them to that of our new Capitol at DesMoines, as it is truly oriental in size, shape and gilding, but the rainbow colors of the towers and the roofs of the houses have no counterpart in this country or West Europe. The uniform brilliancy of these colors, and the even whiteness of all whitewashed surfaces of fences and walls, seem to be due to a degree of skill in mixing and preparing colors peculiar to the east, and possibly in part to the aridity of the air during a large portion of the year.

The arched gateways of the outer walls of the city, and the huge wall surrounding the Kremlin and the main public buildings, are studied next in order. The ancient wall surrounding the Kremlin, with its towers of defense, in dimensions and style of building, is said to be much like the great wall of North China. Our next peculiar views are the gayly painted chimneys and roofs in the residence portions of the city, where they peep through the thick green foliage of carefully planted and well kept gardens.

A drive through the streets on the way to the fair grounds shows them to be wider, cleaner and better paved than those of most West Europe cities of this size, but the business blocks have an oriental, toy-shop expression, and are rarely more than two stories in height. As we pass the street corners the great number of trick-performing jugglers of the east, and fortune-telling and singing gypsies, reminds us of fair times at home, with singular variations. But we were told that pocket-picking and petty thieving are hardly known at fairs in the "land of the east." As we enter the fair grounds the first impression is that of Babel-like confusion of tongues, people and products.

On the streets nearest the railroad stations, and the ten miles of wharfage, the merchandise for exhibit and sale is on the move on the heads of men and women, the backs of horses, asses, oxen, cows, camels and dogs, or loaded on two and four-wheeled vehicles of styles of construction such as we had never dreamed of. But after getting through this transit region

TO THE BAZAAR AVENUES,

we find that horses and vehicles are excluded during the day, and even the centers of the wide streets are occupied with the merchandise of humbler dealers. We also soon discover that the exhibits are mainly in sections or groups. For instance, if we wish to specially study the people and products of Persia, we find them on certain avenues of the grounds, indicated on the plats conspicuously posted in the languages of the east and in French and German. In like manner the people and exhibits of China, India, Thibet, Bokhara, Afghanistan, Beloochistan, Siberia, and even the tribal divisions of Asia and East Europe, may be separately studied on different parts of the spacious grounds. This division of the people and products of nationalities and tribes of the east and west gives an opportunity for critical study of habits, customs, dress, crops and handiwork of the people of East Europe and Asia which could only be equaled by travel in their native lands, involving months of laborious, expensive and even dangerous exploration.

The next general observation of the grounds is that rain is not expected at this time of the year, as the fronts of the miles of shops are open to the weather, and the centers of the hundreds of wide avenues are literally piled with goods for wholesale, retail or exchange. Our encyclopædias give many of the facts and figures of this historic fair, which has come down from a by-gone age, but they do not, and can not, give a clear idea of its influence on the trade and commerce of a large part of the eastern continent, nor of the queer medley of tongues, people, dress and products which is here

congregated during the six weeks of the annual fair. Yet we leave with the fixed impression that from the stand-point of an advanced system of political economy the whole thing is 500 years behind our times.

By the inexorable law of custom the merchant of Astrachan, 1,400 miles down the river, is forced to follow the products and manufactures which pass his door from Persia, Arabia and the Caspian provinces to the far-distant point prescribed for their exhibit and sale by imperious and long-established custom. In like manner the dealers of Perm, and the many cities on the main lines of commercial travel, must follow the wares that pass their doors en route to the great fair. The long and expensive journeys, and still more expensive transport of the goods of buyer and seller, added to the long system of credits between parties hundreds of miles apart, are only a small part of the evils connected with the old custom. Yet, without a complete revolution in system of commerce, for which the people will not be prepared in our century, the fair must continue to exist, and even grow, in all its proportions. As incredible as it may seem, it is the *board of trade* of a vast region, and absolutely the ruling price of each year of tea from China, raw cotton from West Asia, wool of East and West Europe, the ores and worked metals of the Ural, and, indeed, all the main products known to the eastern trade, is fixed each year at the Nizhni fair.

The estimated number of buyers and sellers on the grounds at the time of our visit in 1882 was over a quarter of a million, and the number of nations and tribal divisions represented exceeded one hundred.

When we came to talk of the steamer excursion down the river we were advised to see the agents of the different companies with a view to securing the best arrangements for stopping at points indicated, the best steamer accommodations, and the lowest possible rates. But we were hardly prepared for the active competition of the many companies. We soon grew tired of the long stories, often told in fairly good English, of the unrivaled one hundred and twenty steamers of the Mercury Company, the eighty-five still finer boats of the Volga Company, the seventy incomparable steamers of the Samolet Company, etc. We soon found that fully six hundred steamers are regularly run for passengers and trade on the Volga and its tributaries to varied points on the Caspian. If nothing is said about prices, the tourist will pay the Russian price imposed for the uninitiated in every part of the empire, except on the railways, where the fare is fixed by the government; but a Yankee system of bartering will secure the best cabin passage to Kazan, 250 miles, for eight paper roubles, equaling about four of our dollars.

In size, finish and shape of bottom, the passenger boats of the Volga do not differ materially from the best boats of the Mississippi and Missouri, and, indeed, some of them were built by workmen from Pittsburgh and other points in America. It seems strange in this far-off land to find the best steamers with such names as Amazon, Missouri, Ohio and Montana.

From Nizhni to Kazan the outlook from the upper deck is much like that of the Missouri from St. Joseph to Sioux City, but the breadth of stream

and volume of water of the Volga are much greater. Like the Missouri, the bluffs are loess in formation, but they are rounder, smoother and better adapted to cultivation, as a whole, than those of our great western rivers. So, also, the color and sediment, and the ever-shifting sands and channel, remind us of our Big Muddy.

But while the natural lay of the land and the aspect of the water are familiar, the changes wrought by man remind us constantly of very ancient occupation, and at least partial civilization. On the higher bluffs can be seen the more or less perfect remains of ancient castles of defense of the time when geographers gave the stream the classic name of Rha, and the defense mounds of the ancient Scythians, Sarmatians, Huns, Bolgas and Tartars are visible at every bend.

The steeper portions of the bluffs are covered with deciduous and evergreen trees that give evidence of systematic planting and culture in their first stages of growth. The undulating and level portions are dotted with peasant villages, garden plats, cultivated fields, and orchards laden at this season with high-colored fruits, as noted when the steamer followed the channel often within stone throw of the trees.

At intervals of a few miles we pass neat and clean looking cities and trading villages, with the never-failing accompaniment of expensive and showy cathedrals. Near these cities, on selected elevations, the modern castles and residences of Russian, German, French, Italian and North Tartar grandees and noblemen are as artistic in design and finish as those of the Danube or the Rhine. The lawns, gardens and orchards surrounding these homes of wealth also show the handiwork of the best modern landscape gardeners.

In this connection we may say that the number of nationalities represented by the owners of these palatial residences on the Volga bluffs from Nizhni to Saratov, a distance of over 1,000 miles, was a surprise until we learned that it had been the outgrowth of the wonderful commerce of this river since the time of Peter the Great. Even England is here represented by men who have amassed wealth from the steamboat, milling or manufacturing interests of this busy and populous valley. The peasant villages, seen from the deck, or when rambling in the interior, are uniformly built of logs or poles, chinked with a white and durable cement and thatched with long hay or straw.

As in Germany, these peasant homes differ little in size, mode of structure, or interior finish and furniture. These villages are also alike in their possession of a showy cathedral—quite out of keeping with the cabins and their surroundings—which, in ninety-nine cases out of a hundred, is presided over by a priest of the Greek division of the Catholic church.

We should also add that the owners of cabins of each and all the villages are alike in watchful care of the holy taper, which is kept burning from generation to generation in the holy corner of the main apartment. In connection with the holy taper, which must never go out, the holy corner contains

mementoes and relics from the holy city of Kiev, and manufactured articles said to have been fashioned by St. Vladimir or his descendants. To enter one of these cabins with covered head is the unpardonable sin, not on account of incivility to the inmates of the cabin, but *disrespect* to the holy corner. To such an extent is this accompaniment of the Greek church carried that every railway depot of Central and East Russia has its ever-burning taper illuminating a relic corner; but its presence in such public places is only recognized by the uncovered heads and the solemn demeanor and sign of the cross of the ever-faithful who enter the room.

The only exceptions to the common neatness of expression of the cities and villages from Nizhni to Kazan are those of the Finnish tribes of the province of Cheremy. True to the habits and traditions of their fathers in their natal land, these people are represented by dirt, awkward expression of dwellings and extreme superstition. As an instance of the latter, in their capital city on a public square is a great carved image of Nicholas, the "miracle worker." In the open space in front of this statue the people meet to adjust all disputes and differences without judge or jury. The assumption is that in this august presence the parties and their witnesses can only tell the truth, the whole truth and nothing but the truth.

Our entrance into the ancient North Tartar city of Kazan was quite late in the evening. As we had read of it as one of the main capitals of the North Tartars, we were much surprised to find the streets neatly and smoothly paved and curbed, and the neat and showy business fronts brilliantly lighted by inner and outer *electrical lamps*, of the Ball patent, such as we had not seen since leaving Moscow, 500 miles to the westward. Our first and last impression of this Tartar city of near 100,000 inhabitants was that it was singularly neat and clean, and full of interest on account of the queer mingling of Oriental styles of architecture with the best modern work of English, German and Italian architects and builders. Its university is provided with a library of over 100,000 volumes, a first-class museum containing thousands of interesting relics from the cities without historic record of the great east plain, and a student roll of over 500. The nihilistic tendencies of the English and French speaking students were not hidden from the trusted American visitors, and we have not been surprised to read since our visit that whole classes of them have been sent to Siberia.

Kazan boasts of the possession of 130 manufacturing establishments, and has long been enriched by the control, to a large extent, of the traffic of the Kama river, which for ages has been the main artery of trade of the Volga region with Northeastern Asia, including North China, Mongolia and Siberia. At the great forestry convention at Moscow we had met the manager of forests of the province of Kazan, who promised to go with us to visit some of the fruit-growing estates and peasant orchards of this interesting section. He had assured us that we would here find hundreds of peasant orchardists who derived their incomes entirely from the sale of orchard fruits, and that

a number of titled landholders derived large incomes from commercial orchards. But we found the reality to largely exceed our expectations of the possible in this far northern and interior region, near the 57th parallel of north latitude.

The commissioner kindly spent three days with us, acting as guide and interpreter, giving us a constant succession of surprises in the way of fine and well-managed estates, fine artificial forests of great extent, and large and healthy orchards laden with handsome and good fruit, and this in a climate where no variety of the apple, pear, cherry or plum of any part of West Europe would endure their mildest winter.

Our guide also gave us a fine opportunity to observe that official guidance among the peasants was a good thing from the stand-point of comfort, convenience and rapid transportation from point to point. He controlled the selection of rooms at stopping points, the horses at post stations, and his signal would stop any steamboat on the river when we wished to return to the city. Everything pertaining to these inland excursions was novel in the extreme, and at times grew exciting. For instance, we were often driven from point to point in a four-wheeled drosky without springs, sitting on straw in the bottom of a long flat basket woven from twigs of the willow or birch. To this basket on wheels three spirited, long-winded black Tartar horses were attached abreast in a way we would call awkward and dangerous. The central horse is in heavy shafts, and is guided by one-horse lines in the hands of the driver; but the two outer horses are without lines, and only attached to the central horse with long light tether straps, which permit them to run with their heads outward, giving rise to the constant impression that they were utterly beyond the control of the boyish drivers. We often thought that the drivers wished to astonish or frighten the Yankee visitors by the breakneck speed often attained on a down grade by the strangly geared up team. At first our long drives seemed a constant runaway of the spirited horses, and to the last our faith in the system was not much increased, as we constantly heard of deaths resulting from the wild system of running horses on the official post lines.

But this wild habit of driving is not confined to post lines, as it is common and fashionable among the gentry in all parts of Russia; but the place of the basket drosky in the city and on the estates is taken by the best carriages of West Europe styles. Yet even here the true Russian drives the three horses abreast at a pace not known, I think, in any other country of the world. Our guide at one time, farther down the river, spoke of six widows among the upper classes of the vicinity whose husbands had been killed by wild racing with Tartar horses with the two outer ones totally without the control of lines.

Before leaving the capital of the North Tartars we must speak of the unexpected uprightness of their persons, their fairness of complexion, and their fine cranial development. As this does not apply to the Mongol Tartars, the Magyars, the Don Cossacks, and other tribal divisions farther south,

we must attribute the physical beauty of person and mental development of the North Tartars to climatic influences or to Caucasian descent. Without reference to the opinions of ethnological experts, we can only add that in every part of the empire the North Tartar is found as a provincial governor, a political leader, or a trusted adviser.

A few miles below Kazan the river attains the width of two miles, but skilled pilots and flat-bottomed steamers are still required on account of the ever-shifting sands. To Simbirsk—150 miles—the principal change noted is the increase in volume of water from the inflow of the Kama and other streams, and the increased number of steamers and boats.

As we approach Simbirsk the bluffs on the west bank grow higher, and present the singular geologic formation of chalk rock resting on loose soil, with a thick deposit of black sedimentary soil on the surface, even at the top of the highest knobs. This singular succession of deposits can only be accounted for by the change in the ancient level and sediment of the waters of the Caspian and Black seas, to which we will again refer.

East of the river the bluffs have given way to an interminable dry level plain, over which are seen trains of camels dragging carts loaded with wheat, making their way to the wheat markets on the river. This extended use of camels in a region where the winter temperature often reaches fifty degrees below zero seemed out of place, but we were assured that these fine-haired camels of the East were capable of enduring as low temperature as the North Tartar horses, if provided with fur blankets to protect the fatty humps in which the blood circulation is sluggish. That these camels would prove valuable on our western plains we could not well doubt.

The city of Simbirsk is built on the summit of the bluffs, 550 feet above the river, or, in other words, it is built on the level of the rich black-soiled table-land stretching away to the westward for one hundred or more miles. From the observatory on this summit the magnificent view presented will convince the tourist that the name "Orchard City" is well applied. In all directions, as far as the vision extends, every available space is planted with apple, pear, cherry and plum trees. Even a large proportion of the street and park trees are fine specimens of the silvery-leaved pear that appears to be indigenous to the East. It was called the orchard city 800 years ago, when the Russian poet likened the bloom of the maiden's cheek to the rich color of the apples of Simbirsk, and the inhabitants of the city and its vicinity seem anxious to retain the ancient name and fame of the "Orchard City" of the Volga. From this point was introduced our well known Duchess apple. It was sent to England by a steamboat captain under the name of Borovitsky, and was introduced into its new home in the northwest after it had acquired its new name of Duchess of Oldenburg in France.

The city of Simbirsk is the home of thousands of the owners of the rich table-lands to the westward, and of other thousands who have made fortunes out of some branch of the river trade. Hence, it is noted for its luxurious homes, with every comfort and appliance known to Europe or America. In

this section we saw for the first time extensive fields of corn, melons and tomatoes; the summer heat and aridity of air seeming to mature them about as well as in Central Iowa.

Our guide and interpreter here was an English-speaking lawyer, who owned large estates in the province. We told him of our use of sweet corn, and of our success in growing the Concord, Worden and other grapes. Recently he has assured us by letter that the sweet corn we sent him has produced its first crop, and is regarded as a treasure, and that the grape-cuttings were giving promise of a new era in fruit-growing in the Orchard City.

The importance of this introduction of the American grapes will be understood in connection with the statement that we did not see a native grape-vine on the Volga, and the West Europe varieties of the *vinifera* type fail to endure the dry air and hard winters of this region, as they also fail with us. While Dame Nature was lavish in giving us a number of species of the grape, she wholly neglected this part of Europe. On the other hand, the apple and the pear are indigenous to a large part of Russia, but nature failed to plant them at any point on our continent. From Simbirsk to Samava, fifty miles, the high bluffs and elevated table-lands are continuous on the west bank, and the low pastoral plain continues to stretch beyond the visual range to the eastward. A single estate on the west table-land includes an amount of land about equal to three of our counties. This is the home estate of the Orloff family, who have recently been discussed in the papers as the purchasers of the finest diamonds thrown on the markets of the world. Perhaps no estate of the east can show finer stock, a more complete system of rotation of crops, or more varied and complete buildings, equipments, agricultural tools and machinery than the Orloff estates of East Russia. Outside of the political influence and reported fabulous wealth of the family, the estate is best known in this country as the breeding establishment of the celebrated Orloff horses.

On the Orloff estates and on the elevated plain to the westward we first begin to notice the high smoke-stacks connected with the beet sugar interests of Russia, and in our inland excursions we pass through thousands of acres of sugar beets. The products of these factories are equal in quality to any of the cane sugars of the world. In addition to supplying the home demand and the immense Asiatic trade, the Russian beet sugars manufactured in the great black soil region find their way to this country in large quantity. Below Simbirsk, and in the vicinity of the Orloff estates, we also begin to notice immense mills for the manufacture of linseed-oil and, so-called, olive or sweet-oil. The latter is expressed from sunflower seeds, and the visitor here passes through hundreds and thousands of acres of what we know as the Russian sunflower. Another extensive manufacturing interest of this region, especially east of the river, is the tanning of the celebrated Russian upper leather, glove leather and purse leather, all of which are tanned with the bark of what is known as the desert willow (*Salix acutifolia*).

Opposite Stavopol are the famous Jigulef hills, from which the savage

natives of the Don at the westward preyed upon the commerce of the Volga for over one hundred years. These hills are now divided into little freehold estates, on which fruits and vegetables are grown for the Volga trade.

At Samara the bluffs reappear on the east banks for a few miles as an island remnant of the past flood periods in connection with the rise and fall of the Caspian. Samara has been a central station of the caravan trade between Asia and East Europe for centuries, and it still holds to some extent its old traffic, though much modified by recent extensions of railways over the ancient caravan routes. With its lessened eastern trade, its ancient business of manufacturing the "koumiss" for the refreshment of the caravan traders of the far east has increased to a wonderful extent, but the fermented mare's milk is diverted to a new use, as the place has become a fashionable Saratoga, where rich and fashionable invalids run into all excesses while curing some ill of the body, real or fancied, by the use of the famous "koumiss."

Below Samara for many miles we find rich and prosperous colonies of German Mennonites, who have occupied their present lands since the time of Peter the Great. These Germans much surpass their neighbors, the Calmuck Tartars, in the regularity and expression of their towns and cities, their system of schools, and their modes and methods in agriculture and horticulture. Yet they do not equal the Tartars in the breeding and management of horses, which are not excelled in speed, beauty and endurance by any breeds of the world.

Passing many interesting cities and evidences of very ancient occupation by a dense population of this black soil region, we reach Saratov, also on the bluffs of the west bank, which are here rounder, smoother and richer than farther north. Though an old city, its expression is new and clean on account of continued application of paint or lime washes to everthing exposed to the air, and the extreme durability of these washes in this dry interior climate. The streets are regular, wide, well paved, and systematically planted with trees. By methodic planting is meant that as we pass from street to street we meet a constant succession of change of species and expression of foliage. This note on methodic planting of street trees brings to mind the fact that we did not see a tree in the valley of the Volga which we had reason to believe was planted by Dame Nature, except the willows, alders, birches and elms on the sand-bars of the river, and these seedlings are constantly utilized for systematic planting on the prairies.

At Saratov are located the largest and best flouring-mills we saw in Europe, and they are not excelled by any we have unless it may be by some of the mills at Minneapolis. On the table-lands west of the city are found the largest apple orchards we saw in Europe. One of these contains 24,000 trees in one connected plantation, all of which are systematically watered in time of need with water pumped by steam or wind mills from the valley below into great cisterns on the highest points of the orchard. The estimated cost of watering each tree twice during the growing season is only five cents, and the increase in the size and quality of the fruit is said to average one dollar

per tree. With the same method and system the watering of orchards and small fruit plantations could be made extremely profitable in many parts of our country.

Here we must sandwich in the remark that many of these great commercial orchards are owned by members of the peasant class who have risen, as in this country, by a process of development to the ownership of property and the ability to wisely manage it. Again, it may be well to say that we did not meet a peasant orchardist on the Volga who was not able to read and write, which are no mean acquirements in a land where only a small per cent. of the peasant population can write their own names.

Below Saratov the river has an average width of three miles, and the thrifty looking cities on the west bank are more thickly planted than at any point above. On the east bank, however, the towns on the low, sandy plain have a dingy business look, and their main uses are as headquarters for the pastoral interests, and for storage of the grain brought in by the camel trains from the east.

The city of Kamyshin, a few miles below Saratov, is noted in the history of the Volga as the point where the robbers of the Don gathered, prior to the time of Peter the Great, to prey upon the river commerce. To guard the position Thomas Baillie, of English education and descent, was employed to superintend the erection of fortifications and extensive barracks for military use, which are still supposed to be necessary to keep in check the piratical Don Cossacks. Here, also, can be seen traces of an extensive work undertaken in the sixteenth century to connect the waters of the Black sea and the Caspian by way of the channel of the Don. Had the work been completed, it would have made changes in the lower Volga valley not realized at that time, when the difference of level between the two inland seas was unknown.

The city of Sarepta was founded by the Moravian brethren of Germany in 1765. It is yet communistic in management of property, and the general arrangements as to board, common property, system of labor, etc., do not differ materially from the system adopted in the communistic colonies on the Iowa river in Johnson and Iowa counties. This old German colony is noted for the production of prepared mustard, sweet-oil from sunflower seeds, and the growing of melons and fruits for shipment up the Volga and by rail to the northeastward.

Astrachan, near the Caspian, is an ancient town of over 50,000 inhabitants, mainly engaged in the sturgeon and general fishery interests of the river estuaries and the Caspian. An idea of the extent of the business may be gathered from the fact that the average catch of the city inhabitants is over 80,000 tons, and in 1883 the number of fish caught was over 150,000,000, principally sturgeon, pike, sea perch, herring and bream. From this point was brought the first specimen of the Russian apple, under the name of White Astrachan, which Loudon dignified with the specific name *Malus Astrachanica.*

At Astrachan we begin to be annoyed with mosquitoes and house flies, which are rarely seen in the drier valley above. Here, also, fresh sedimentary deposits begin to attract attention as near the mouths of the Mississippi. We also note that the bed of the river *is being lifted up* by the mud deposits, and that in time of high water the whole plain to the eastward is flooded, leaving successive deposits of sand and black earth sediment. We now begin to fully realize the truth of the story we have read and been told, that we have been sailing for days in a dry valley, with scarcely an observable trace of bayou, marsh, or wet spot outside the river banks—a valley teeming with population and busy commerce, yet actually far below the level of the Black sea or the ocean.

Literally the bed of the Volga, below Saratov, is below the ocean level, and it empties into a great depression in the earth known as the Caspian sea, which at the bottom is from 100 to 200 feet below the level of the Atlantic or Pacific, *and so far as known this great sink-hole is without outlet.* Into this great depression run the waters of the Volga and its many tributaries, draining an area equal to many states like Iowa, with seven other rivers, which drain a still larger area, including a large portion of the south slopes of the Caucasus range, where the annual rain-fall is excessive.

With these facts before us we are ready to believe that the evaporation from the 180,000 square miles of the Caspian can not equal the inflow from the eight rivers and smaller inlets, and to fully believe the statement that the water level of the Caspian *has raised* within a recent historic period many feet. Alexander the Great passed his troops dry-shod over an arm of the present sea, which now has a depth of water of over forty feet, and the foundations of buildings erected by Alexander at Derbend are now fifty feet below the water surface.

In view of these facts, some of our scientists believe that the Volga in time will again resume its ancient course into the Black sea in the present valley of the Don, and the whole level plain east of the Volga, and as far north as Simbirsk, will again be flooded, and deposit a coating of the black sediment brought down by the river and its tributaries. But all this need not disturb the peace of mind of the present czar, nor the plans of tourists who may decide on a sail down one of the largest, busiest and most peculiar rivers of the world, as the present rate of filling up of the great area below ocean level will require at least 800 years.

It may be of interest to add that the final filling up of the Caspian basin, and the flooding of the low steppes east of the Volga, will not, in the opinion of experts, prove an unmixed evil. While millions of acres of the steppe will be flooded, a still greater number of acres will be doubled, and even quadrupled, in value by the change of climate wrought by increase of rainfall and atmospheric moisture. Indeed, the promise of added value to the higher steppes of East Europe and Central Asia from this filling of the basin below the Black sea is such that the project has been agitated for several years of hastening the natural period of filling the basin by digging a canal,

permitting the waters of the Black sea to pour into the lower steppe levels. We learn that engineers are now at work on surveys and estimates of cost, and that the scheme has far more credit among European capitalists than had the Suez canal, or the present great scheme of De Lesseps to unite the Atlantic and Pacific at Darien.

At the close of Prof. Budd's lecture the President introduced Mr. Cutter, of Riverside, who read the following paper:

LIMITATIONS OF RAISIN GRAPE CULTURE.

BY J. E. CUTTER, OF CALIFORNIA.

Physicists have divided climates into two general classes—continental and oceanic. The latter are distinguished by equability, their temperature having no wide annual range. In North America they are found along the entire Pacific coast, extending inland as far as the great continental divide, except where the Cascades and main Sierras interpose a previous barrier. That of Florida and the close borders of the Gulf of Mexico belong to the same class. Crossing the Atlantic, we find all of Western Europe and all shores of the Mediterranean in the same order. Over all those sections most members of the *vinifera* family of grapes range, except where northern severity bars out their running vines. But the Muscat has hugged the dry, warm slopes that face this great inland sea from the time when wise Abigail met the anointed but fugitive king of Israel with the present of "a hundred clusters" of its sweet fruit. If any one questions whether those raisins were Muscatels, it is in order for him to explain of what variety they were!

No district of perennial rains seems adapted to its growth, and as in Europe it will not thrive inland and along the cool wet coasts of the Atlantic, so in America it does not succeed in Florida and along the gulf. Its field is in Arizona and California, and its capricious choice is not suited even with all parts of these. We know that it requires warm air and warm soil, but we can not tell why it succeeds at Orange, in Los Angeles county, and fails amid the vast wine grape vineyards of the San Gabriel valley, and by the base of the Sierra Madre; then crossing to the eastern side of the great San Bernardino valley, reaches its highest limit of production and profit on the iron-grained silt of Riverside and Redlands, whose climate and soil differ widely from those of Orange. Here in both of these unlike soils it thrives, while it rejects their medium. Of all its family, the Muscat seems most sensitive to cold, wet and disease. Wherever other members of the *vinifera* species fail, it will also fail, but the converse is not true. It prefers to get its water from a ditch rather than from the clouds. (The rancher prefers it also when he has 3,000 trays of its sweet pellets drying under an October sky.) Irrigable mesa lands must ever form its principle fields, though there are some warm lands that have water in sub-strata ten feet, more or less, from the surface that bring the same by capillary action to the roots, sufficient and not in excess.

Sensitive but not sub-tropical, the area of our state that is available for it, though far less than the field of the cereals, is far greater than that which is adapted to citrus fruits. From the upper limits of the Sacramento valley southward through to the Mexican border are large districts where the raising of this grape is a proved success. We can also claim that, though its culture may not be financially safer to engage in than that of the wine grape, yet its products are safer to take! Henceforward, all through the states, long as our country shall live, the school-boy will think with sweetened interest of the sunny land that raised the clusters his mother put with his lunch.

DISCUSSION ON RAISIN CULTURE.

Mr. Smith, of Wisconsin—What is the average yield of raisin grapes in California?

Mr. Cutter, of California—The price per box of twenty pounds ranges from 75 cents to $2, while the yield per acre varies from 100 to 300 boxes. The usual net return per acre may be put at from $125 to $150, though mine have averaged as high as $304. The expense of culture, etc., including water, per acre, is about $25. It is a fallacy to talk about succeeding without water. Irrigation is sometimes overdone, but it is our only security against frequent failures. Irrigation should not be frequent, but thorough. The occasional fogs of this region take the place, to some extent, of irrigation.

Mr. Rudisill, of California—Mr. Cutter's statements in regard to the yield of raisin lands are very fair; indeed, they are somewhat below what I have realized. Raisins grown in our foot-hills are somewhat more difficult to cure owing to the greater rain-fall. In Spain the raisin grape is grown without irrigation. There the yield per vine is not more than two or three pounds; here we often produce from forty to fifty pounds per vine.

Mr. ————, of Fresno, California—Fresno produces about one-half of the raisins sent out from California. The vineyards in our county were about doubled in extent in 1887. The raisin crop of Fresno county, last year, was in excess of 400,000 boxes.

Mr. Cutter—If you will guarantee us one-third of the present prices of raisins and oranges, we will engage to increase our area of plantations.

On motion, the Society adjourned to meet at 9 A. M. to-morrow.

Sixth Day—Thursday.

MORNING SESSION, February 9, 1888.

At 9 o'clock A. M. the Society re-assembled.

H. K. Bradbury, of Santa Barbara, read the following paper:

RARE FRUITS OF THE SANTA BARBARA REGION.

BY PROF. H. C. FORD, OF CALIFORNIA.

That portion of Santa Barbara county lying between the Santa Ines range of mountains and the Santa Barbara channel, with an east and west trend of the shore line, having a southern exposure, with protection on one hand from the north winds in a mountain wall from 3,000 to 4,000 feet in height, and on the other in a chain of outlying islands that break the force of the summer trades, together with the close proximity of a body of water which maintains a uniform temperature of 62°, renders this district fitted to the production of certain fruits, some of which are not generally supposed to thrive without protection within the limits of the United States. The temperature of this region seldom falls below 40° or rises above 90°, with an average rain-fall of seventeen inches. The cherimoyer, white sapote, avocado, date, banana and guava will not thrive where there is much frost, while the Japan persimmon, pomegranate and loquat will bear a greater degree of cold, and consequently will find a wider range of growth in our country.

The cherimoyer (*Anona cherimolia*) is a native of Peru, and Humboldt on his visit there denominated it one of the most delicious fruits of the earth. It was introduced to this region about twenty-five years ago. The parent tree, now standing in the grounds of A. Packard, Esq., has attained its full height of sixteen feet, and has produced abundant fruit for many years in such perfection that the seeds have readily germinated, and trees thus propagated are in successful bearing in several Santa Barbara gardens. The leaves are oval and pointed at both ends; flowers solitary, very fragrant, and having a greenish color. Good specimens of the fruit are three or four inches in diameter, often heart-shaped, grayish-brown or nearly black when fully ripe. The flesh, in which thirty or forty brown seeds are contained, is soft, sweet and pleasant to the taste, being highly esteemed in its own land both by natives and foreigners. Like many other tropical fruits, it is most palatable when near decay. By many persons in this locality it is pronounced excellent, while others speak of it with indifference. Apparently, it has no particular season for ripening in this neighborhood, yet the best specimens seem to be found at the April and May exhibitions of fruit.

In the grounds once occupied by one of the mission gardens is a tree of the white sapote (*Casimiroa edulis*) about two feet in diameter, with sturdy,

upright branches, forming a beautiful head of dark green leaves. This tree was planted by the mission fathers about ninety years ago, as near as can be ascertained. Another tree of the same species is growing in a garden in the lower part of the city of Santa Barbara that came from seed received from Mexico, and planted by one of the Spanish citizens about forty-five years ago. It is found growing both wild and cultivated in the states of Sinaloa and Durango, and elsewhere, in Mexico, and is known there as the *Zapote blanco.* It belongs to the Rutaceæ, and is more nearly allied to the orange than any other American plant. Our Spanish fellow-citizens also know it under the name of zapote. Its leaves are palmate, three to five parted, with glistening upper surface; flowers small, greenish-yellow, growing in clusters with short peduncles on the old wood. Here the tree is usually in flower during January (often earlier), the fruit maturing in March or April. It varies from half an inch to an inch in diameter, pale yellow in color, and is not agreeable to the taste until in a soft state. It has a rich, sub-acid flavor, our native Californians being exceedingly fond of the fruit. The older tree is about twenty-five feet high, and has about the same spread of branches, while the younger is nearly as large, both forming fine heads of dense evergreen foliage, making it desirable as an ornamental tree for street or other planting, and would no doubt bear the climatic conditions of many other localities.

A tree of the tropical species alligator pear or avocado (*Laurus persea*) is flourishing in the grounds of Mrs. F. Sawyer, of Montecito. It was planted by Mr. Silas Bond sixteen years ago, and has borne fruit for the past three years, which has appeared at our horticultural exhibitions. This tree is now about twenty feet in height, and appears in a thriving condition. The bark is smooth; leaves oblong, with prominent veins; flowers yellowish-green; fruit purple in color, with the dimensions of a medium-sized pear, but more oval in shape. It contains a kernel inclosed in a soft rind and yellow pulp. The latter has the delicate rich flavor of the peach, yet to most tastes much more grateful. In the West Indies the inhabitants, on account of its richness, apply some spice or acid, such as lime juice mixed with sugar. Of the three varieties there grown, red, purple and green, the latter seems to be the favorite. In its native habitat it is eaten with avidity, not alone by man, but by birds and quadrupeds. The seeds of the fruit raised here are sufficiently perfected to possess the germinating property, and other trees are being propagated. A small tree that has not yet borne fruit is flourishing in the garden of Judge Ord, in the city of Santa Barbara.

The date palm (*Phœnix dactylifera*) has perfected its fruit on the estate of the late Col. W. W. Hollister for the past three years, fine bunches of dates from this plantation having been exhibited at New Orleans at the late exposition, at the state fair at Sacramento, at Los Angeles, and at the local exhibitions of the Santa Barbara Horticultural Society. These palms are now about sixteen years old. They are carefully cultivated, and irrigated several times during the drier portions of the year. The suckers that spring from

the base of the trunk in the earlier years of the palm are annually removed. This palm being diœcious, it is necessary to hang the staminate flowers over the pistillate blooms in order to insure proper fructification where the male and female trees are not planted in close proximity. Palms of this species have fruited in a few other localities in the state, but the product has not been as satisfactory as at the place under consideration. That the raising of dates for market will ever be a profitable industry in this special district, or any other locality in California, is a problem for future horticulturists to solve, but the results already obtained certainly render further experimentation desirable.

Among the tropical fruits that find here suitable conditions is the guava (*Psidium pyriferum*), examples of which are found in numerous Santa Barbara gardens. In its wild state in the West Indies it is a large shrub, but in cultivation it attains the dimensions of a tree, with five or six inches diameter of trunk. The wood is exceedingly hard and tough; the leaves about three inches long, in pairs opposite each other, and the flower white, with an agreeable perfume. The fruit is from one to three inches in diameter, having a smooth skin, and a peculiar musky odor that is disagreeable to most persons. The seeds are contained in a flesh-colored pulp, that is sweet, aromatic and very palatable, the pleasant taste lingering some time after eating it. It is used as a dessert fruit and is preserved with sugar. The jelly made from this fruit has long been universally esteemed. Excellent products from home-grown fruit have been prepared by Santa Barbara housewives. To insure success in the preparation of the jelly, partially ripened fruit should be used. The strawberry guava (*Psidium cattleyanum*) is a variety that is now being planted quite extensively, being a more hardy species. It has a smaller fruit than the preceding, being less than an inch long, purple in color, and of delicious flavor, somewhat resembling strawberries. This tree attains the height of twenty feet at full maturity.

The banana (*Musa sapientum*) has been planted in almost every garden in our neighborhood, and fine bunches of fruit have been perfected. It is not claimed that the fruit reaches so high a degree of perfection as in the tropics, but certainly excellent, well-ripened and flavored specimens are not uncommon, and it is believed that with more care in the selection of situations, and by planting in large groups, with high fertilization and proper irrigation, much better results may be attained. One grower in Montecito asserted that on every day of the 365 his family were supplied with ripe fruit from his plantation, principally from the *Musa Cavendishii*, the dwarf species. The noble Abyssinian banana (*Musa ensete*) is being quite widely planted for its superb tropical appearance in the landscape, but its fruit is pulpless and of no value. Of other fruits, drawn from sub-tropical regions, the Granadilla (*Passiflora edulis*) or water-lemon, purple when fully ripe and pleasing to many tastes; the Tuna (*Opuntia tuna*), a refreshing fruit, introduced by the Franciscan fathers, and much esteemed by the native Californians, and the Eugenia (*Eugenia myrtifolia*), from Australia, a highly orna-

mental tree, with bright-green foliage and a pleasant flavored fruit, about the size of a cherry, may be mentioned in this list.

The Loquat (*Eriobotrya Japonica*), which Rhind, in his "Vegetable Kingdom," ranks as a tropical fruit, is produced here in as great perfection as in its home climate. Being a native of Japan, it also thrives in the region of our Southern States bordering on the Gulf of Mexico, as well as throughout central and southern California. It is in blossom during the early winter months, and by March and April the fruit is to be obtained in our markets, where it finds ready purchasers. Ripening at a time when other fruits are comparatively scarce, with its delightful and refreshing acid flavor, it promises to become still more popular. Efforts are being made to introduce a new variety from Japan that is said to be much larger in size than that now planted, having more pulp with smaller seeds. Belonging to the Pomaceæ, it may be grafted on any species of this genus. The long dark-green and rigid leaves, the deliciously fragrant flowers, and the golden clusters of fruit, render it a favorite in our ornamental planting. The fruit will bear shipping, and would, no doubt, find favor in our eastern markets.

The pomegranate (*Punica granatum*) seems to have been first introduced by the mission fathers to this region, and there are still living trees of great age in some of the mission gardens. The tree at maturity is from fifteen to twenty feet in height, having numerous slender branches often armed with thorns. The leaves are opposite, about three inches long, and of a beautiful green. The flowers are produced at the end of the branches on the new shoots. The calyx is very thick and fruity, and of a fine red color, the petals being crimped and scarlet. The beauty of the tree, not taking the fruit into account, has caused it to be planted in many of our gardens. The fruit is a large berry, covered with a hard leathery coat, and crowned with the tube of the calyx, contributing to its singular and beautiful appearance. A large number of seeds are contained in the crimson-colored pulp, which has a sprightly sub-acid flavor, agreeable and refreshing, though it requires some dexterity to separate it from its leathery covering without getting some of the juice or flavor of the latter in the mouth, which, owing to this skin being very rich in tannin, is quite astringent and bitter. It ripens here in October, but if not gathered will remain on the tree in good condition for several months. To bring the fruit to its greatest perfection careful cultivation is required; in fact, a neglect of this will be paid in a penalty of barren trees. Fine specimens are always shown at our autumn exhibitions, and it is occasionally found in our markets. With proper attention it might be profitably grown.

I will only briefly refer to the Japan persimmon (*Diospyros Kaki*), which is raised in this district in its most satisfactory development. This fruit is rapidly and justly growing in popular favor. Natives of the Southern States who have been accustomed to our native persimmon are enthusiastic when they taste the Japan fruit. Its astringent quality entirely disappears when the pulp becomes soft. It is easily transported when picked at the

proper stage, and doubtless it could be shipped to advantage to eastern markets, where its splendid color would certainly make a unique adornment for the table. It is now sold in our markets at five cents per pound, but often commands a higher rate. This fruit can be grown in any portion of the United States where the temperature does not fall below 14° above zero.

The *Lichi* of China, *Hovenia dulcis* of Japan and *Carica papaya* of Peru have been introduced, but the trees are not yet old enough to produce fruit. It need not be stated that the conditions that are favorable to the growth of such fruits as we have had under consideration are also especially congenial to the whole citrus family, as well as the fig and the olive. Add to these the whole range of temperate-climate fruits, where is the land that can furnish a greater variety of such productions grown in the open air than California?

DISCUSSION ON PROF. FORD'S PAPER.

President Earle, of Illinois—The reading of this paper only confirms the opinion I had formed during a short visit to Santa Barbara a few years ago, viz.: that for variety and extent of fruit produced that region excels almost any known locality on the earth's surface.

Mr. Smith, of Wisconsin—Such papers as we are receiving will add great interest and value to our forthcoming volume of transactions.

Secretary Ragan, of Indiana—The seemingly extravagant remark has more than once been made in our meetings here in California that the soils and climate of this favored state would raise "anything." It would almost appear from this last paper that such was really true. We have here what we shall accept as reliable testimony, which is more than affirmed by the Santa Barbara exhibit in the pavilion, that many of the truly tropical fruits may be successfully grown on California soil.

Mr. Bradbury, of California—The statements of Prof. Ford may be implicitly relied upon, as he is a man of the highest veracity and moderation. As a further testimony to the character of our section for fruit-growing, I wish now to invite any of the members of this Society who may remain in this state to attend our fruit and horticultural exhibition to be held in Santa Barbara in the month of March.

Prof. Coquillette, of California, read the following paper:

THE VALUE OF ARSENIC AS AN ADDITION TO THE KEROSENE EMULSION.

BY PROF. C. V. RILEY.

In an address which I had the honor to deliver at Riverside last spring, in continuing the question of washes, and more particularly the kerosene emulsion, I made the following suggestion:

Again, if permanency can be given to the effect of a wash, so that the few insects escaping the first application, or which would hatch out thereafter, would succumb, such addition would be invaluable; and though the arsenites are, as a rule, effective chiefly against mandibulate insects (or those which masticate their food), in other words, although the action of these poisons is mainly through the stomach, yet I happen to know from experience that they have also a direct effect by contact. Therefore, I recommend, with considerable confidence, that in this diluted kerosene emulsion there be added a small proportion of arsenious acid, say from two to three ounces to every fifty gallons of wash. This arsenious acid may be prepared and added in various ways. Probably one of the simplest would be to take half a pound of arsenic to half a pound of sal-soda, boil this in one-half gallon of water until the arsenic is dissolved, and mix this with about 100 gallons of the diluted emulsion. A quarter of a pound of London purple to 50 gallons of the diluted emulsion, or even a still greater amount, would, perhaps, serve the same purpose, and be less likely to injure the tree.

I am aware of the danger of making recommendations that have not yet had thorough trial, but I have already made a few limited experiments (and intend making more) which would seem to justify these, and, at all events, if care be taken not to use too large a quantity of the arsenic, no harm will result from it, either to the tree or to those who use the fruit.

It gives me pleasure to announce that, so far as the experiments go, they confirm this recommendation, and I submit herewith a portion of the report recently received from one of my agents, Mr. Albert Koebele, on experiments in this direction. Also, some further experiments with resin compound and arsenic acid.

MR. KOEBELE'S REPORT.

In the main I followed your suggestions, while here in April last, in preparing the kerosene emulsion, viz.: to emulsify with resin compound and use arsenic acid in addition. I am glad that your hopes in this wash are verified. In every instance where your proposed arsenic acid was added either to emulsified kerosene or resin compound, there has been a complete extermination of the scales.

At first too much of the arsenic acid was used, resulting in more or less injury to trees treated, particularly so in weak washes.

The best results in preparing the emulsion were obtained by taking one

part of the kerosene to one part of lukewarm resin compound. Thus I obtained two gallons of emulsion in less than three minutes that did not show any trace of separation before the end of twenty-four hours. The result would have been not quite so good if the resin compound had been used hot in emulsifying, and still less so if two parts of kerosene had been used to one of resin compound; but still this last will make a very good emulsion if prepared properly, which is easily done. It has the good quality of spreading instantly over the leaves, if sprayed with dilutent, as well as do soap washes. None of the experiments made during dry weather with this emulsion alone, *i. e.*, without the additional arsenic acid, were appreciably effective. The evaporation was very rapid, and in ten minutes after the application no trace of the wash could be seen.

In addition, I include results of various experiments with resin compound, especially upon *Aphidæ*, which it affects admirably; and, at the same time, a wash can be prepared which will destroy all aphids and not injure the larvæ of syrphus flies, nor prevent the parasites from hatching from the infested aphids.

Experiment 178—Kerosene emulsion 167, with arsenic acid, of which one pound in 55 gallons wash. Emulsion one part; water fifteen parts. Applied August 30 on *A. rapax* on pear. September 1, leaves spotted, turning brown. September 7, all leaves dead and dry; bark not injured, except on few smallest twigs; scales all killed. October 7, tree bringing forth new shoots all over; some in blossom; all buds not dead growing. November 22, new shoots of eight inches in length had formed; fruit did not set; tree in good condition, still growing. December 17, tree fresh and green; no scales whatever.

Experiment 179—Kerosene 167, with arsenic acid, of which one pound to 52½ gallons wash. Emulsion one part; water twenty parts. Applied August 30 on *Aspidiotus* sp. on currant, and *A. rapax* on cherry. September 7, leaves nearly dry and falling off; scales appear to be dead, but still have their natural color. October 7, all scales and eggs dead; young shoots forming on currant. November 22, currant plant still growing; some blossoms and young fruit; ditto scales. December 17, no scales; a few of the berries have become mature, but are small.

Experiment 180—Kerosene emulsion, with arsenic acid, of which one pound to 55 gallons wash. Emulsion one part; water two parts. Applied August 30 on *Aspidiotus* sp. on currant, *A. rapax* and *M. pomorum* on apple. September 7, scales on currant where in thick layers not all dead; a few eggs and newly hatched young found; *A. rapax* on apple not all dead; gravid females and eggs of *M. pomorum* not affected; leaves of apple dry, and those on currant nearly so. October 7, scales on currant all dry; plant growing; *A. rapax* on apple all dead; eggs of *M. pomorum* in good condition. November 22, no living scales on currant, this still growing; eggs of *M. pomorum* still intact.

Experiment 181—Kerosene emulsion 165, with arsenic acid, of which

one pound in 55 gallons wash. Emulsion one part; water fifteen parts. Applied August 30 on *Aspidiotus* sp. on currant. September 7, leaves of plant all dry; a few of the scales still living; also, eggs and newly hatched young found. October 7, all scales dead; plant in good condition. November 22, no living scales can be found. December 17, no living scales on plant.

EXPERIMENTS WITH RESIN COMPOUND AND ARSENIC ACID.

Experiment 185—Resin compound and arsenic acid, of which one pound in 85 gallons wash. Compound one part; water sixteen parts. Applied September 2 on *Locanium hesperidum* on orange. [All orange trees experimented on were in poor condition, received no water during summer, and leaves were curled.] September 7, most of the young and tender shoots destroyed, a few leaves falling; scales appear to be dead. September 13, scales all dead; leaves still falling, only few remaining on tree. November 22, no living scales; tree growing, full of young shoots, but very few of the old leaves remaining. December 17, found four young scales, which evidently have come from neighboring trees; tree in good condition again, still growing.

Experiment 186.—Resin compound and arsenic acid of which one pound in 90 gallons wash. Compound one part; water eight parts. Applied September 2 on *L. hesperidum* on orange. September 7, scales dead, found a few living young under mother scale; a few leaves falling. September 13, all scales dead; about half of the leaves have fallen. October 7, no living scales. November 22, about one-third of the leaves remaining; tree otherwise in good condition. December 17, tree in good condition; no living scales.

Experiment 187—Resin compound and arsenic acid, of which one pound in 100 gallons wash. Compound one part, water four parts. Applied September 2 on *L. hesperidum* on orange. September 7, scales all dead. September 13, no living scales; about one-quarter of the leaves have fallen. October 7, tree in good condition, not injured beyond the loss of a few leaves; all scales, lichens and fungus destroyed. November 22, tree in very good condition; no living scales.

Experiment 189—Resin compound and arsenic acid, of which one pound in 170 gallons wash. Compound one part, water sixteen parts. Applied September 13 on *L. hesperidum* on orange. October 7, many scales still living; nearly half of the leaves have fallen. November 22, all scales dead; tree in good condition. December 17, no living scales on tree.

Experiment 190—Resin compound and arsenic acid, of which one pound in 200 gallons wash. Compound one part, water four parts. Applied September 13 on *L. hesperidum* on orange. September 21, scales nearly all dry; no leaves whatever have fallen. October 7, scales all dried up; no leaves have fallen. November 23, no scales on tree, which is in very good condition.

EXPERIMENTS WITH RESIN COMPOUND.

The strongest application of this was made on pear and plum, infested with *A. rapax*, August 27; three quarts of the compound to four of water. (Experiment 176) September 4 all traces of waste had disappeared, not injuring the foliage of plum. The leaves of the pear were very brittle for the first few days, and some tips of older leaves turned black, but none came off, and otherwise no injury was done. An occasional living scale was found October 7.

One part of the compound to two of water. Applied on February 28 on *A. rapax* on pear. (Experiment 160.) Rain fell for two days following, and the result, perhaps, was not as good as it would otherwise have been. A careful examination on March 8 showed that a large part of the eggs had been destroyed, also all the young and many of the older scales. On this tree they did not increase, and on November 21 hardly any living scales could be found. Other experiments were made of the same strength on *Aspidiotus* sp. on currant, and *A. rapax* on pear, August 27. (Experiment 175.) All but a few gravid females were destroyed on pear, and very few remained on such places where they had been in thick layers on currant. October 7, a few young scales were found on both plants, but hardly any were living November 22. The wash disappeared in ten days, leaving the trees in good condition; no leaves fell.

Three parts of compound to eight of water were applied on orange thickly infested with *Lecanium hesperidum* September 2. (Experiment 184.) In five days after application no living scales could be found, and on none on November 22. The tree was not at all affected by the wash.

One part of compound to four of water applied on pear with *A. rapax* February 28 (experiment 159) destroyed all the smaller and part of the older scales, but soon after the scales were increasing again. The same strength was also applied on *Diapis rosæ* on rose March 8 (experiment 162). This effectively cleared the plant of scales; and again on *L. hesperidum* on orange September 2 (experiment 183). All scales were dead on September 7, and none living could be found November 22.

One part of compound to eight of water on *L. hesperidum* on orange September 2 (experiment 182) destroyed nearly all scales, but many living young were found under mother scales September 7. Only very few living scales were found in tree September 13 and October 7, but on November 22 the tree was covered with scales again.

Other experiments of this strength were made, and may be worthy of mention: On *L. oleæ* on orange, and on several peach trees in full blossom, infested with the *Lecanium* bred from oak (*A. agrifolia*). Here, also, many of the scales survived. The trees in consequence were loaded with fruit, as well as those not treated.

EXPERIMENTS ON APHIDÆ WITH RESIN COMPOUND.

The woolly Aphis (*Schizonoura lanigera*), the cabbage Aphis (*Aphis brassicæ*), the plum Aphis (*Aphis pruni*), and Aphis on rose (*Siphonophora rosæ*).

Two experiments were made at Berkeley on the woolly Aphis, in conjunction with Messrs. Klee and McLennan. One and three parts of the compound were used to eight of water. Owing to imperfect spraying only the last did effective work. The leaves of the trees were falling at the time of spraying, and the effect of the solution, especially on trees where three to eight parts of wash were applied, was very noticeable, as the first tree lost about half, while the second lost nearly all its leaves. On my visit to the place a month later, however, there was little difference in the trees treated and others infested with woolly Aphis, for those also began to lose their leaves about two weeks after, as I was informed by Mr. McLennan, the gardener, who is a very careful observer. Mr. Klee recommends this wash in the proportion of one and one-half pints compound to one gallon of water.

I have made numerous other experiments, and always had complete success in killing this insect with one part compound to eight parts of water. With this proportion, also, those on roots which were reached were killed. I would recommend the same, viz.: one part of the compound to six parts of water, on woolly Aphis. On the other hand, the plum Aphis, cabbage Aphis, etc., are much easier to kill. Only one part of compound to eight of water was used in experiments at Berkeley (August 10) on plum Aphis, and none were living on examination August 17. At this strength the Aphis will die instantly, and will not be able to move a leg if once wet. I have killed them successfully even with a wash as low as one part of the compound to sixteen parts of water, and would recommend one part of the compound to twelve parts of water for plum Aphis, Aphis on rose, etc. At this strength it may be safely used on any garden, and even on the most tender hot-house plants, without the slightest injury to the plants themselves. It should be used somewhat stronger on the cabbage Aphis. One part of the compound to eight parts of water will be found effectual. At this strength it was found that the larvæ of Syrphus flies were not injured by wash, nor were the parasites of the infested Aphis in any way affected, providing the skin of the Aphis was dry when sprayed.

A lot of house-flies (*Musca domestica*) which had concentrated out of doors were sprayed with this solution, and died almost instantly. A large flesh-fly (*Sarcophaga*) thrown into a weak solution, one to sixteen, taken out and set on board, never moved its legs again. Fifteen minutes after, slight convulsive movements were noticed on under side of body, and soon after all life was extinct. A codling moth (*Carpocapsa pomonella*) sprayed with a solution of one to eight was dead in nine minutes. Cut-worms (larvæ of *Agrotis saucia*) dipped in this mixture were not affected.

It will be of interest to note that while in Los Angeles in April, 1887, the following labels on trees treated for red scale (*A. aurantii*) were still present: "Experiments with resin soap, 127, 147 and 149." All those trees were free from red scale and *L. oleæ*, but full of *Icerya*. "Experiments with resin compound, 133 and 156." No red scales could be found on these trees, but *L. oleæ* were numerous on tree of experiment 133. Both trees were badly infected with *Icerya*.

DISCUSSION ON PROF. RILEY'S PAPER.

Mr. Ohmer, of Ohio—My experience in the use of arsenical washes has been satisfactory. A weak infusion of London purple, five or six ounces to a barrel of water, sprayed over my apple trees has greatly reduced the damage from the codling moths. I use a spraying apparatus which is manufactured at our place that is very complete and thorough in its work.

Mr. Lewers, of Nevada—The only insect pest which we are seriously troubled with is the codling moth. Our method of warfare against them is to trap the larvæ in bands of rags or other substances fastened about the trunks of the trees. These are removed occasionally and the larvæ destroyed.

Prof. Klee, of California—Arsenic mixtures have been largely and satisfactorily used in this state. White arsenic, London purple and Paris green have each been employed. The London purple must be used with care, as it will injure the foliage. Paris green is effective and less dangerous to the foliage. Some trees will bear a greater amount of the poisonous mixture than others. The Bellflower is more susceptible than the Pearmain. Sometimes a single pound to 300 gallons of water will seriously injure the foliage. The cotton scale insect is the great enemy of the citrus orchards, but even this can be successfully combated by the scientific application of remedies. Hydrocyanic gas has been successfully used to destroy the scale insect, and the experiments thus far seem to indicate the practicability of the remedy.

President Earle, of Illinois—I apprehend that it is the microscopic fungi that orchardists of California have most to fear. It seems to me that it will take all your energies to guard your fruits against such pests.

Prof. Coquilette, of California—Sprays of arsenic solutions are injurious to the foliage of trees. The gas treatment is the best yet tried. The tree is inclosed in an air-tight tent, which is filled with a mixture of hydrocyanic gas diluted with carbonic acid gas. If the hydrocyanic gas be passed through sulphuric acid the proper result will be attained. The cost of treating an orange tree amounts to about $1.50, as retail prices are now, but this can be reduced at

least one-half. The fumigation should be kept up for about one-half hour.

Mr. Hubbard, of New York—Arsenical sprays are largely used in our state, and without harm to man or trees.

Vice-President Munson, of Texas—The ordinary fruit-grower fails to see his potent but insignificantly small enemies. He, therefore, neglects to use remedies. Fungi can generally be destroyed by the same agents which will destroy insects. Spraying is the best method. There are a number of instruments used for spraying;. probably a French instrument is the most perfect. The desideratum is a perfect spray. It must be a *fog*, and no drops of the mixture should be visible. Every pest from a mildew to the scale can be destroyed by careful spraying, and yet no injury result to fruit or foliage.

Mr. Ohmer—The Dayton, Ohio, spraying apparatus I referred to is the invention of a tobacconist, who first used it for moistening his tobacco before working it. The spray from this instrument is as fine as the dew-fall, and may be freely applied without danger.

The President—A cyclone nozzle can be applied to almost any instrument. The codling moth may be destroyed by means within the reach of all industrious orchardists.

Mr. Stevens, of Texas—By proper industry and skill we may master such pests.

Mr. Rudisill, of California—The reason that the curculio is not found in California is probably due to the fact that our climate perfects the insect at a season in which there are no fruits in condition for it to feed upon.

Mr. Masters, of Nebraska—There are insects of the weevil family resembling the curculio, which the investigator may easily mistake for it.

Mr. Munson—We have a new insect pest in our Texas nurseries. It is a small green beetle, and is very destructive, but may be destroyed by the use of arsenical sprays.

Mr. Munson, of Texas, presented the following protest, and asked that it be spread upon record:

We, as members of the American Horticultural Society, hereby place on record our protest against the introduction of political questions at our meetings.

We further express our disapproval of the political resolutions on the tariff adopted at San José, for the reason that it was an improper question to be presented or passed on by the Society. Signed by T. V. MUNSON,
J. C. RIDPATH,
ABBOTT KINNEY,
C. C. BROWN,
W. G. VEAL,
ROSS LEWERS,
J. B. DURAND,
H. K. BRADBURY,
H. B. FRANCIS,
PRESTON RIDER.

The following paper on hybridization was then read by Dr. Ridpath:

HYBRIDIZATION.

BY PETER HENDERSON, OF NEW YORK.

In plants, as in animals, "the selection of the fittest," as Darwin terms it, is indispensable to get at the best results. It is a curious fact, however, that in many kinds of plants that the higher types of perfection that are obtained, the individuals are less fertile. Last season we were fortunate in getting an unusually fine strain of fringed double and single petunias, and though we operated on nearly one thousand plants that were grown in seven and eight-inch pots, filling a green-house twenty by one hundred feet, yet it took one man from June to November to get one ounce of hybridized double seed, so that this ounce of double petunia seed cost us in actual labor alone about $250.

Our plan of hybridizing was the usual one of removing the undeveloped stamens from the single flowers, so that there could be no possibility of self-fertilization, and then applying the pollen from the finest double flowers. Done carefully in this way, we are safe to expect at least 75 per cent. of double flowers.

We have the same meager results of seeding from the new strain of mammoth verbena, again showing that the higher the type the greater the sterility. We planted out twenty thousand seedling plants of verbenas, covering nearly four acres, and only got some four pounds of seed, or about one pound from each acre. Seedlings of the ordinary strain of verbena would have given from five to ten pounds of seed per acre. I may here state a fact not generally known, that seedling plants of verbenas produce seed much more freely than plants made from cuttings. In 1886 we set out over twenty thousand mammoth verbena plants, made from cuttings, for the purpose of obtaining seed, and obtained less than half a pound from the whole lot. Of course, in such a flower as the verbena, hand fertilizing by the

camel's-hair brush is impracticable, but we found it helped the seeding greatly to brush the flowers lightly every day or two with a feather duster.

I have had no personal experience with the hybridizing of roses from seed, but the grand results obtained by Henry Bennett, of London, were obtained in hybridization by using, as far as possible, contrasting colors and widely different classes; thus, crimson with white in color, and the hybrid perpetual with the tea classes. Mr. Bennett found that the seedlings as a rule partook more of the characteristics of the male than the female parent, and hence in crossing was careful to obtain the highest standard of excellence he could procure for that purpose.

A question was raised, a year or two ago, whether or not hybridization affects the fruit in such plants as strawberries, melons, etc. All my experiments so far have gone to show that such is not the case. If you impregnate a dark-colored strawberry with a light-colored, or a tart with a sweet, or *vice versa*, as far as my observation has gone, no perceptible change takes place in the color, taste or shape of the fruit. Nutmeg melons carefully impregnated with cucumber pollen showed no change whatever in either flavor, color or shape. That the seed would be influenced there is no question, but the pericarp or fruit-case—analogous to the womb in animals—as far as my observation has gone, is in no way affected by hybridization. Consequently, you may grow all kinds of strawberries as close as you please, and if you only want the fruit you will get it practically pure. So, too, you may grow alongside of each other cucumbers, melons or squashes, if their fruit only is wanted; but if grown for the seed product, keep them as far apart as practicable. We are so impressed with the necessity for this that, in Kansas, where we have the most of our cucumber and melon seeds grown, we have only one variety grown by one farmer, and we also try that the farms be as far apart as possible.

I beg to be excused for such a brief and imperfect treatise on such an important subject, but the multitude of my duties prevents my giving the necessary time that it deserves.

DISCUSSION ON HYBRIDIZATION.

Prof. Budd, of Iowa—Types of fruits differ with different surroundings. The St. Michael is a smooth, thin-skinned orange, but I find them often with welts or stripes of rough, thick skin, which I believe to be the result of the fertilization of that particular lobe of the fruit by the pollen from other varieties. This same feature is often noticeable in the Roman Stem and other apples which grow near those of different characteristics. Mr. Fuller and other high authorities believe in this effect.

Mr. Wier, of Illinois—Pollenization will change the character

of the fruit. I have gathered perfect Rambo apples from Willow Twig trees growing near trees of the Rambo.

Prof. Klee, of California—Every orange-grower has observed the fact that oranges impress themselves on their neighbors. I can not agree with Mr. Henderson.

Mr. Munson, of Texas—I have here some St. Michael oranges with external markings which must be due to some influence—probably to the proximity to other varieties. It will be noticed that some of these have the thicker-skinned lobes or sections which have been referred to, while others exhibit markings peculiar to the Washington Navel.

Major Holsinger, of Kansas—I have also found the Blood orange very distinctly impressed with the character of its neighbors.

Colonel Veal, of Texas—I regret that this paper is going into our printed report without correction in this important particular.

Mr. Durand, of Missouri—I have thousands of apple trees in my orchards, with varieties mixed and planted promiscuously among each other, and I have never been able to recognize but that the fruit of each was true to its own peculiar character.

Mr. Wier—Some varieties are much more susceptible of this influence than others. The Willow Twig apple is changed by many varieties, notably the Rambo, the Rhode Island Greening or the Bellflower.

Mr. Durand—I have frequently noticed what I regard as *sports* on trees situated long distances from other varieties.

Mr. Klee—We should remember the distinction between a *sport* and *variations* due to pollenization. Nectarines have often been produced as sports. These are bud variations or sports, and should be so regarded. This is quite common with the orange.

An invitation by the Santa Fé Railroad Company to visit San Diego on to-morrow was accepted, after which the Society adjourned to meet at 2 o'clock P. M.

Sixth Day—Thursday.

AFTERNOON SESSION.

The Society met at 2 o'clock P. M., President Earle in the chair.

Mr. Munson of Texas, Mr. Johnson of Indiana, and Mr. Budd of New Jersey, were appointed a Committee on Resolutions.

It was decided to spend Tuesday next, the 14th, at San Bernardino as the guests of that city.

FIXING THE PLACE OF THE NEXT MEETING.

Col. Veal, of Texas—Presuming that the place of the next meeting would be fixed before the adjournment of the Society, I have taken it on myself to present the claim of Texas to this honor, and to fortify myself properly have brought with me these letters. I will not worry you by reading all of them, but will say that they are from our governor, our secretary of state, from the secretary of the state immigration committee, from the mayor of the city of Fort Worth, from the president of the Fort Worth Immigration Association, from the president of the Fort Worth Merchants' and Manufacturers' Bureau and from the president and secretary of the Farmers' State Alliance of Texas. These invitations are all of the most earnest and cordial character, and I may add that they are seconded, in spirit at least, by all our citizens. There are many of our citizens who know something of this great Society and its mighty influence for good, and they desire to know more of it by having it meet in our midst.

Mr. Munson, of Texas—I wish to indorse every word which Colonel Veal has so well said in favor of holding the next meeting in Texas.

Mr. Smith, of Wisconsin—I move that we accept the invitation to meet in Texas.

President Earle—I have been converted by the earnestness and the eloquence of our Texas friends, and am now prepared to vote for the motion.

The motion to meet in Texas in the month of February, 1890, was adopted, and the Executive Committee were authorized to decide upon the date and place of the meeting.

Mr. Munson, of Texas, presented the following report:

SOCIETIES AND ORGANIZATION.

REPORT OF COMMITTEE ON SAME.

(Compiled and presented by the chairman of the committee, T. V. Munson.)

MR. PRESIDENT: In pursuance of your appointment as chairman of this very important committee, I early corresponded with each member of it, requesting reports upon the number of societies and members in each, in their respective states and sections of country at large, giving also the general condition of and progress in such society work.

I likewise asked their views concerning coöperation in meetings and work among our national horticultural societies of every character.

To this last every one responded, as shown in their letters given herewith; but only one definitely concerning his state and local societies, that one being Mr. L. A. Goodman, Secretary of the Missouri State Horticultural Society, who wrote:

"WESTPORT, MO., November 21, 1887.

"*T. V. Munson, Chairman of Committee on Societies:*

"We have now fifteen good societies in our state, all in good working order, helping each other and the state in our work.

"We organized four societies last summer, and the good work is just beginning. Our societies have held shows of fruits and vegetables this fall, and paid good premiums. One of them offered $400 in premiums, and about three thousand persons attended. A good beginning for horticultural fairs!

"Our state society is prospering and doing good work, as never before. Our membership and interest are continually growing, and it is our aim to have a well organized society in nearly every county in the state. It takes individual work to accomplish the best results, and to organize local societies.

"L. A. GOODMAN, *Sec'y.*"

I learn, Mr. President, that the state of Missouri gives her state society from $2,000 to $3,000 annually to publish reports, prosecute society work, and pay an energetic, competent Secretary. There is an example all our states may emulate with great profit. We all know the high character and value of Secretary Goodman's reports.

COÖPERATION OF NATIONAL HORTICULTURAL SOCIETIES.

Mr. President, this is the main burden of this report, and I quote from a letter to me from our good Secretary, written September 26, 1887, as follows, which explains why I enter this part of the report so earnestly, with all candor and kindness of feeling not only for our own great society, but as well for all our other national horticultural societies, having good friends in all, and membership in most of them, as also have the other members of the committee, and in fact nearly all our members.

In that letter Secretary Ragan said, in referring to the idea of *coöperation* (not consolidation, or obliteration, or loss of identity of any one, mind you), and a name for the coöperation suggested by myself: "'American Horticultural Union.' Yes, that is the title. Certainly, no jealousy can arise over that name.

"Now, I want to start this matter by placing you on the programme of the next meeting to present the subject. The start made last year at Cleveland will enable you to get the subject before the meeting. Prepare yourself accordingly."

But, at the very outset, I am met with the following seathing, unjust, unkind and incorrect criticism, which appeared as an editorial in the *Country Gentleman* of June 2, 1887:

"'AMERICAN HORTICULTURAL SOCIETY.'—From Mr. W. H. Ragan, Greencastle, Ind., Secretary of the society which has adopted the above name (formerly the Mississippi Valley Horticultural Society), we have a copy of the transactions for the year 1886, including the proceedings of the Cleveland meeting last year. While we always hail with pleasure all successful efforts to promote the improvement of horticulture, and to add to the substantial pleasures resulting from increased skill in propagation, planting, pruning and culture, and to extend the right hand to all engaged in giving these cheap comforts and luxuries to the people at large, we can not help taking some exception to an unwise course with so excellent an end in view. On looking over the volume before us, we find ten pages occupied with a list of the seventy-two horticultural and kindred societies in the Union, of which several are national in their character, with a large number of state societies. Some of these have had nearly half a century of active and influential existence, while this new society, with its scattered and partly paid membership, *places itself at the head!* A subordinate position is given to the American Pomological Society, whose labors for thirty-seven years in connection with its established state committees, and the continued revision of its unequaled catalogue of fruits, have given it a place above any other association of the kind in Europe or America. The Massachusetts Horticultural Society, with its energetic and useful labors for half a century, the Pennsylvania society, and several veteran state organizations, which have accomplished so much for the cause in which we are all laboring, are to be at once assigned to a subordinate place to this new society! Secretary Ragan, in his published remarks, expresses his desire to see 'an American Horticultural Society,' with its auxiliary branches in pomology, forestry, floriculture, etc.; and, to favor this end, a letter from a well known cultivator is published, in which he charges the late President Wilder with 'being jealous' of this new association, and remarks that as soon as the president is gone he proposes to unite the two—one a veteran body, well organized in every state, and the other a young claimant, the existence of which is yet barely established.

"The proposition is made to unite under this new one the American Pomological Society, the American Forestry Congress, the Society of American Florists, the National Association of Nurserymen, all under its leadership. Should this conglomeration be accomplished, those who have had experience with bringing a multitude of subjects into one general meeting may readily comprehend the nature of the confusion which would follow the crowding together such an assemblage of reports and discussions. The proposed advantage of saving travel by the union may still be accomplished, if desired, by an agreed union of time and place between the different and separate organizations, in the same way that the American Association for the Advancement of Science and the Society for the

Promotion of Agricultural Science meet at the same place each year, on different days. The *Country Gentleman* is always ready to extend a helping hand to every agency for the promotion of so excellent a cause as the extension of horticultural improvement in all its departments, but in doing so could not aid in any ill-advised movement."

It will be observed that the *Country Gentleman* ends by proposing identically the plan of coöperation upon which we are working. So we are, fortunately, of the same mind, and the criticism falls harmlessly to oblivion as simply the result of a misunderstanding. So we feel more encouraged than ever to harmonize and coöperate our national horticultural societies.

Before discussing definitely a scheme of coöperation, we should be assured that there is really a need and demand for such a movement. To ascertain this, I give here the judgment of a number of our best members and thinkers. Under the present condition of our organizations jealousies are said to exist, and the most potent remedy for this canker-worm is thought to be coöperation. That coöperation must be of such a character as not to kill or sink the identity of any of our societies; on the contrary, it should conserve and strengthen each and all. Heed the following counsel.

In a letter to Secretary Ragan, August 10, 1887, the Hon. T. T. Lyon, now Vice-President of the American Pomological Society, wrote:

"The fact can not have escaped you that (while beneath the surface) the jealousies which I years ago feared have come to have existence (though probably altogether unwarrantable). I, in seconding the motion to make the Mississippi Valley Society national, was moved by the wish to have a national horticultural society in the full, general sense of that title. * * * *

"The coming meeting at Boston seems certain to prove a critical period in the history of the American Pomological Society; one at which its future plans must be considered and settled, and therefore the best possible time to bring up the unification plan, with which you have been more or less connected. I can see no sufficient reason why something of this character, not compromising the legal, corporate existence of the society, may not be devised and be made advantageous to all concerned. I am not sure but that the American Horticultural and American Pomological Societies might not hit upon some plan upon which they could coalesce so as to insure the elimination of the present (and perhaps prospective) jealousy between them. I earnestly hope that by some means the pomologists of the whole country may be saved from the danger of divided counsels and antagonistic operations. Very truly yours, T. T. LYON."

The Hon. C. L. Watrous, President of the American Nurserymen's Association, wrote me as follows, November 23, 1887:

"MY DEAR SIR: Relative to the proposed co-operation, I am very free to say that, in my judgment, the Horticultural Society, the Pomological Society and the American Forestry Congress should be merged and worked together. The same class of men, and mainly also the same individuals, interested in one are interested in the work of all, and would be glad to meet all congenial minds at the meetings. This object can never be accomplished except by a unification. I think the work of unification one of the most important of all those lying ahead of us. Yours, very sincerely, C. L. WATROUS."

C. M. Hobbs, Secretary of the Indiana Horticultural Society, wrote me, November 26, 1887:

"DEAR SIR: I believe we should have one American Horticultural Society, covering the entire subject of horticulture in the United States, and, probably, including Canada. With our county, state and national horticultural societies, we have quite a heavy tax upon our purses and time. There should be an understanding between neighboring states in regard to time of holding state meetings, that they might not conflict, as is so often the case now. I trust you will put on foot at the next meeting of the American Horticultural Society means that will result in the union of the pomological and horticultural societies. Truly,

"C. M. HOBBS."

"WESTPORT, Mo., December 15, 1887.

"FRIEND MUNSON: I objected to the renaming of our Mississippi Valley Society, and always believed we could do more and better work by leaving the American Pomological Society in the lead, and believe so yet. I think, if we could all report to that society, and make it more prominent than it is, giving it greater influence and power, getting every state society to be a part of *one great central society*, I am sure, *almost*, that such a society could have enough influence with the Commissioner of Agriculture to induce him to adopt the central society as the mouthpiece of the department in horticultural matters and publish its reports, connecting the work of the United States Pomologist with it. I should not like to see the officers and all controlled by the political parties, but leave the society free to select its own officers and plans. Such a society would be an honor to our government, our states, and our horticulturists. L. A. GOODMAN."

"WABAN, NEWTON HIGHLANDS, MASS., December 14, 1887.

"DEAR SIR: I have delayed answering yours of November 19 in hopes that I might have clearer views upon the subject of 'the unification of our national horticultural societies.'

"It is well known that the late Mr. Wilder was very jealous of the American Horticultural Society, feeling that it encroached upon the ground of the Pomological Society. The characteristic enterprise of the Mississippi Valley Society very naturally developed into national proportions, and it has honestly attained this position. Our country is so vast, and the interest in horticulture so beyond estimate, that it would seem as though the elder would hail the advent of the younger to assist in cultivating so wide a field. * * * *

"The workings of the two societies, while separate, must be very similar, to satisfy the members, and hence it hardly seems possible to keep up a proper enthusiasm in both without rivalry and conflict of interests.

"On the other hand, it does appear that a union of the two would not only combine strength, but would also awaken a new interest, which would place *one* organization on a more prominent and firmer foundation than *either* can occupy by itself. I trust that it may so appear when you meet in California, and that a committee will be chosen by the horticultural society to consider the subject, and, if deemed expedient, to confer with the pomological society with reference to a union of the two societies. Very sincerely yours, WM. C. STRONG."

In a letter to Secretary Ragan, April 20, 1887, Prof. E. S. Goff, horticulturist to the Experimental Station of New York, said:

"What I want to see is a merging of the two societies in the near future."

J. M. Smith, President of Wisconsin State Horticultural Society, wrote me November 22, 1887, as follows:

"It has seemed to me, for some years past, that there is a tendency to too many societies; that if the American Pomological Society and American Horticultural Society could be consolidated into one good, strong and healthy organization, and could work in harmony with each other, and meet at least once in each year, and have at least a four-days' convention, it might be productive of more good than both are doing at present. Yet I may be mistaken.

"Our country is so large, it has so many and such a diversity of interests, that perhaps it is better that they should remain as they are. One thing is evident to all friends of both societies: we need more means in order to get out our publications. I do not see just how this difficulty is to be remedied. Perhaps you can suggest some practical plan. I hope so."

Similar sentiments to those already presented were received from other able members both of this and the American Pomological Society, and hence I am emboldened to propose *a plan of coöperation of all American horticultural societies, of whatever character, under the general title,*

THE AMERICAN HORTICULTURAL UNION.

Under this head it is proposed to show, *First*, that by disunited or separate, individual action of the present national horticultural societies, of which there are no less than six or seven, great expense of time and money is required to conduct them, only partial and much inaccurate work is done by each, and much ground gone over by one is again as ineffectually traced by others, thus unnecessarily burdening and finally discouraging the members of each, and gradually, by lack of support, the officers, burdened beyond all endurance, also become discouraged, interest dies out, and these organizations, which should be perpetual and of great value to every member and the country at large, soon will cease to exist. Statements in the communication just read clearly indicate this, and we must meet the issue like philosophers and statesmen if we would survive.

Second, that the immense extent of country, climate and variety of interest among all classes of horticulturists in North America demand distinct yet coöperative organizations. Coöperation in general effort and object would reduce all expense of travel and time to members, and the working expenses of the societies in securing data, announcing meetings, programmes, and publishing reports, and demanding aid of the Department of Agriculture to assist in disseminating useful information collected by them in all branches of these fundamental industries to the lowest cost; also, such vast interests in voluntary education in these highest of all pursuits demand the most thorough *division of labor*, that no two will be doing the same work and leaving undone other just as important work.

They demand the perpetual existence of an American Pomological Society and American Horticultural Society, an American Forestry Society, an American Viticultural Association, an American Nurserymen's Association, an American Florists' Society, an American Seedsmen's Association, and a Society for the Pro-

motion of Agricultural Science, all of which, by virtue of such need, are now in existence. There is a demand for still another organization coëxtensive with all these—an American Fruit and Vegetable Exchange, to discuss the preparation for handling and distribution in all markets.

These organizations are for educative and coöperative purposes, to develop the greatest good and happiness for the greatest number, not for competitive and monopolistic objects.

There is no demand for an American Pomological Society, if truly such, and an American Horticultural Society occupying the same field and doing the same work. The misconception by some that this is the case with these two great societies has unhappily led to some unnecessary jealousies, where otherwise there should be the strongest friendship.

Third. Now, we wish to show that there is a scheme already in practical operation which, with modifications to suit our needs, will accomplish the results we so much desire:

The American Association for the Advancement of Science is such an organization. Each branch or division has its own head and organization. All meet at one time and place, but for special work in separate rooms.

Topics of general and unusual interest, treated by the ablest minds, are delivered in lectures before all in one assembly. The work of this association is respected throughout the world of science.

Here is a pattern we must follow if we would survive and become eminently useful to the world. We occupy a field of work of equally vast importance to the world as do the natural scientists, and reach more directly the toiling masses. Then, let us not longer stand isolated, and yet in each other's light and way, but join heads and hearts most cordially and earnestly in this great coöperative work.

Let me suggest, for modification and improvement by wiser heads, the following scheme:

Let this society to-day appoint a committee of three or five of its ablest, most experienced heads in statesmanship, to urge upon the other national horticultural societies already named in this paper the appointment of a similar committee by each at its next regular meeting, with instructions to all such committees to assemble themselves together at the next meeting of the American Pomological Society—it being the oldest of all, the most thoroughly organized of all, and thus the most fitting to first announce the result of such a conference of committees.

Dare I suggest further? Should I, let it not be imputed to me for arrogance or pedantry, but purely for the desire to hasten the day when we shall see all our present national societies coming together in perfect harmony, annually or biennially, at the same time and in the same city, but from point to point successively in various parts of the continent where the best inducements for conducting meetings can be offered.

Then let the conference of committees appoint a place of meeting for all the societies to convene together in 1890, and submit to such joint meeting a scheme of perpetual coöperation, to there and then be discussed, modified and adopted, and at once be put in course of active execution.

Might I suggest a name for such a coöperation? "American Horticultural Union" let it be, as that truly and simply designates the action, and can arouse

no jealousies. Under that each present society would retain its name, its organization, officers, and all distinctive features. Into the charge of the Committee of Conference, which should be perpetually renewed, and might be called "The General Council" or "General Executive Committee" of the Union, would be placed all matters of general interest, in providing places of meeting, securing excursion rates, conferring with the Commissioner of Agriculture for appropriations to publish reports, etc.

Or this committee might be termed the "Executive Council and Committee on Organization and Societies." As such, it could also ascertain the names of all state and local horticultural societies, secure rosters of their officers and lists of members, for publication in the general reports, thus interesting all horticulturists everywhere in the general work. Articles of unusual merit and general interest could be culled from reports of such societies and republished in the general reports. Thus we would connect and harmonize our entire horticultural interests, make our labors immensely more useful, at a greatly reduced expenditure, and make the title, "Member of the American Horticultural Union," one to stand equally respected the world over as is "F. R. S." or "F. L. S."

Fourth. Let us try to conceive what would be the actual working and effect of such coöperation.

At first it might be that only the American Pomological, American Forestry and American Horticultural Societies would respond, unless the committee be composed of unusually able, influential and active workers, when we might reasonably expect other societies to speedily join the Union. But after one joint session I am sure the advantages would be so apparent and satisfactory that the other societies would fall gracefully into line through necessity of self-preservation. Then we would hail the announcement of meetings of the "American Horticultural Union" with joyful anticipations. The prowess of such extensive coöperation would secure the very best excursion rates, the lowest and best hotel rates, likewise all other needful expenses would be reduced to the lowest possible figures. As a first result, the attendance and membership all round would increase amazingly, and thus means would readily be found to well pay the Secretaries, whose burdens would be greatly lightened, while now they are overworked beyond all reason and hardly paid a mere pittance. There being but one meeting in every one or two years, every one would be eager to attend. With such great saving of time and money, and receiving in return so much more and better matter and many times broader acquaintance, the annual dues could be somewhat increased, and more willingly and promptly paid than now. All would be glad then to have meetings continue a week, instead of only a day or two, as now; and thus the work be far more thoroughly done, future plans of work fully discussed and put into more effectual execution, friendships more thoroughly made, and, above all, in a business point of view, and which is not to be accomplished by the present state of things, would be the meeting of the nurseryman and fruit grower, the seedsman and gardener, the florist and home-adorner, the forester and farmer, the fruit and vegetable growers, and the commission men—in a word, the producer and consumer.

They would be brought together under the most friendly aspect, and could discuss together their special needs. In this way the good would be increased and

the poor culled out. This one feature alone would make the coöperation worth attempting. Besides, the Department of Agriculture could most consistently step forward and easily lift from the Union its greatest burden, the publishing of reports, being well prepared to do such work at the least expense to the country, and at the same time most effectually in the matter of illustrations, uniformity of good work from year to year and extensive circulation, and all the time working in its legitimate sphere, that of collecting and publishing useful information. Then, instead of regarding the work of the general government as that of office-seekers, and a mass of formalities and "red tape" without usefulness, a real burden, we would feel that *this* arm, at least, of the government is "of and for the people."

Our national societies generally, I am led to think, are ready and anxious for coöperation, if only the simple and feasible plan, which will bring success, can be devised.

After communicating the above plan to various of our leading horticulturists, I received a number of similar responses to the following:

"WESTPORT, Mo., December 20, 1887.

"I am glad to learn your plan. I thought of it in that way, but did not dare to mention it. Such a union as that would control enough and have influence enough to ask what it would and it would be granted.

"I am with you in that plan. Make your report in that way.

"L. A. GOODMAN."

"WABAN, NEWTON HIGHLANDS, MASS., December 28, 1887.

"MY DEAR SIR: You have an admirable, a most comprehensive, a grand plan for the union of all our national societies connected with terra-culture. Such union should bring strength and create an interest which would bring together the able men in each department at least biennially, if not annually. I doubt not your suggestions will receive the hearty indorsement of the Society, and I trust some steps will be taken to bring them to practical results.

"Very truly yours, WM. C. STRONG."

But, Mr. President, suppose that, after all, we fail to engage our national societies in a coöperative union. It will then become necessary to organize *this* Society into *divisions*, if we would be a great and lasting institution. Novelty and exciting excursions can not always secure the continued services of our best workers. Great students, discoverers and authors can not be retained by such chaff. We must have the thorough and systematic organization founded upon the principles of coöperation of the different fields of horticulture with judicious division of labor. Such an institution only will attract and retain the ablest talent and extensive support, and will command the respect of the whole country. Thus, I conceive, we *must* have *coöperative divisions* within our own Society, if not obtainable by union with others, to be eminently useful and permanent.

My heart and hand shall ever be ready and enthusiastic in the sacred work of coöperation.

DISCUSSION ON THE REPORT.

Major Evans, of Missouri—I move that the report be concurred in as the sentiment of this Society.

Mr. Hubbard, of New York—I am not quite sure of the practicability of the suggestions. The American Nurserymen's Association, being quite distinctively a business organization, would probably object to coming into such an arrangement.

Secretary Ragan, of Indiana—I have always thought that much more good might be accomplished through the strength of union than in our present weak and scattered condition. This is all there is of this. If we can, by uniting our energies, accomplish more in the way of building up American horticulture I am in favor of making the effort.

Prof. Budd, of Iowa—There is doubtless a strong feeling in all the bodies in favor of union. There are also many reasons why such a step should be taken.

The motion of Major Evans was adopted and the following committee of five appointed to confer with other organizations and report at the next meeting of this Society: Mr. Munson of Texas, Mr. Smith of Wisconsin, Mr. Strong of Massachusetts, Mr. Hubbard of New York, and Secretary Ragan of Indiana.

The following paper was then read by its author:

LIMITS OF PROFITABLE CITRUS FRUIT CULTURE.

BY H. J. RUDISILL, OF CALIFORNIA.

It is with much diffidence that I undertake the discussion of the subject allotted to me by the officers of your Society, both on account of the great scope of the matter to be considered and the limited time at my disposal from other duties to devote to it.

The cultivation of citrus fruits is unquestionably one of the most attractive branches of horticulture. They do not fail, with their bright evergreen foliage, fragrant blossoms and golden fruit, to stimulate even the octogenarian in horticulture to a renewal of his interest in this occupation, and to a desire to plant and own a grove.

Until within a comparatively recent period the Latin and Mongolian races have possessed a monopoly of citrus fruit culture. But now the Anglo-Saxon has entered the field in both continents, and, with his accustomed system and energy, is infusing new life and new ideas into this calling, and, true to the instincts of the race, makes the pertinent inquiry: "What permanent profit is there in it?"

The family of citrus fruits is divided into five prominent branches, to wit: the orange, lemon, lime, citron and the shaddock, or pomple mosse or pumalo, and in the profitableness of their cultivation stand in the order named. Therefore, in treating this subject I will consider only the orange, as the representative of the family, the hardiest of the race, the most generally cultivated, and the most profitable.

Originating, as it is now supposed to have done, in the warmer portions of Asia, the foot-hills and table-lands of the Himalaya Mountains, it was but little known, and only occasionally mentioned in myth and story, until about the tenth century of the christian era, when it was first distinctly noticed by Avicenna, a prominent Arabian physician of that period. From that time it was gradually introduced and acclimatized along the shores of the Mediterranean Sea. The sweet orange passed through Persia and Syria to the Ionian isles, the shores of Italy, Sicily and the south of France, and, according to Loudon, reached the south of England about the sixteenth century, where it was cultivated only for a short time successfully as a wall fruit. The bitter orange passed through Arabia, Egypt and the north of Africa to Spain and Portugal. Through the Spanish and Portuguese explorations and conquests it was carried to the Azores and the Maderia islands, to the West Indies and to Florida, Mexico and South America. In situations favorable to its growth it is now found in a zone spanning the earth extending from 40° south to 46° north latitude, and from the level of the sea to an elevation of 5,000 feet above.

It is especially cultivated for profit in Syria, Turkey, Egypt, Northern and Southern Africa, Greece, Italy, France, Spain, Portugal, the Azores, West Indies, Brazil, Mexico, a portion of the gulf coast of the United States, Florida, Southern California, and to some extent in Central and Northern California, the Sandwich Islands, Japan, Australia, a portion of China and India. If we were to judge, therefore, from the great area of territory and remarkably diverse conditions in which the citrus fruits are found, we might readily conclude that they could be profitably grown at any point adapted to them within the latitudes named above. This is not the case, however, for experience has taught, and is annually teaching us, that climate, soils, varieties and markets influence and control the profitableness of citrus fruit culture to a greater or less extent than mere geographical limits. We will therefore consider these in the order named.

CLIMATE.

That of the Azores has been considered by many of the authorities as the best for citrus fruit culture. Possessing a moderately humid atmosphere, with a mean temperature of 58° in winter, 61° in spring, 68° in summer and 62° in autumn, and a minimum temperature of only 40° and a maximum of 90°, and free alike from the desiccating winds of Africa, and the cold northers that prevail throughout Southern Europe, the citrus fruits are produced there readily, without irrigation, in great quantities and of the best quality.

The isothermal lines that indicate the limit of the growth of the citrus fruits along the northern shores of the Mediterranean, under which name I include all its arms or branches such as the Ægean and Adriatic Seas, etc., show a much greater diversity of location than those along the Pacific coast, and a greater range of temperature than the climate of the Azores. At Joppa, on the coast of Syria, in latitude 32° north, the orange is grown profitably near the sea-shore and inland to an elevation of about 800 feet above sea level, but only extending about four miles distant from it. This narrow belt, in varying widths, follows the shore line around the Ægean and Adriatic Seas to Venice, Italy, in latitude 45°, where, however, the orange is not grown successfully for market, but what few are grown require expensive winter protection. At Lake Garda, the largest of the Italian lakes, and in latitude 46° north, having a peculiar and exceedingly sheltered position, the orange and lemon have been profitably grown for centuries. This, I believe, is the extreme northern limit of profitable citrus fruit growing in the world.

The eastern shore of Italy is too cold for the citrus fruits, and only in favored spots along the western shore, from Calabria north to Genoa, can they be successfully grown. From Genoa the line passes westerly and southerly along the coast of France to Barcelona, Spain, in latitude 42°; thence in a narrow belt along the sea-coast to latitude 37°, and thence west along that parallel of latitude to the Atlantic Ocean; thence north up the coast of Portugal to latitude 41°. Near the southern limits of this isothermal line there are large areas of country in Asia Minor, Thessaly, Calabria, and even Sicily, not adapted to citrus fruit culture, on account of the extremes of heat and cold prevalent.

Experienced cultivators in these countries claim that a maximum temperature of over 104° and a minimum temperature of 28° Fahrenheit are both injurious to the growth of the orange. While the limit of safety as to temperature may be considered as located within this range of the thermometer, orange-growers in Southern California have found that, under favorable conditions, both the tree and fruit will bear a much higher temperature, and, for a brief period, a temperature of 22° without serious injury. Shelter from strong winds from any quarter is also a condition of successful culture of this fruit, while sufficient moisture to keep the tree in a healthy, vigorous growth is a necessity.

SOILS.

Although the orange tree is found to flourish well in warm, fertile soils, composed principally of sand and loam or sand and clay, it will not continue productive for even a brief period without maintaining its vigor and strength by liberal applications of manure; hence, the limit of profit in this direction is very soon reached by the decrease of crops produced and the increased cost of fertilizers. Orchards depending entirely upon irrigation for their supply of moisture have, I think, a decided advantage over those dependent upon the rain, as the waters used in irrigation, both winter and summer, especially in open ditches, carry with them a large amount of fertilizing

matter which can easily be placed by this system, to use a common expression, "where it will do the most good."

VARIETIES.

It is only within comparatively a brief period that horticulturists have recognized the necessity of adapting varieties to localities to make a success of fruit-growing, and to-day there are many intelligent people who do not know that there is any material difference in oranges, and that they are not ripe and edible as soon as they take on their yellow color.

It is now well known that the whole citrus family is prone to change from differences in soil and climate, as well as from its natural tendency to "sport," when cultivated from seeds after the manner of most of our orchard fruits. It is also said that in many parts of the West Indies and South America the whole orange tribe is found growing wild, springing up spontaneously from the seeds of the trees originally planted by the Spaniards, varying in size, form, and in every gradation, from the lime to the shaddock. Oranges are often found there equal in flavor and sweetness to those of the Azores, though of much larger size, while others in the same grove vary from these to a degree of sourness and acrid bitterness sufficient to draw blood from the mouth accompanied by severe pain. There you may see the lemon, citron, lime, shaddock, and sour, sweet and bitter oranges growing indiscriminately together in the same forest. They are round, flattened, rough, smooth, obovate, pear-shaped, thick and thin-skinned, juicy, dry, some with and others without seeds, some bearing seed at the end, outside of the fruit, while others present a navel-like protuberance at the same point with no seeds, and in passing through these groves it will be observed that some trees will contain but little fruit, while others will be loaded to excess.

I consider this tendency of the citrus fruits to sport, and their adaptation to localities, as one of the most promising aids, in the hands of intelligent horticulturists, to the gradual extension of citrus fruit-growing into regions now thought to be unfavorable to it. We have already the sour orange stock and another from Japan as claimants for superior endurance of low temperatures and moist subsoils, with the power to impart this quality to some extent to more valuable but much more delicate varieties, grafted upon them. The claim for the Japan variety is that it will endure, for a brief period, a temperature of near the zero of Fahrenheit. In the foot-hills of the Himalayas, and also in the table-lands of the province of Durango, Mexico, it is said there are varieties that are grown successfully within the limits of the snow line, but the minimum temperature of the region is not given. There is, therefore, much to encourage the fruit-grower in less favorable localities in a search for varieties that may possess a greater endurance of occasional low temperatures and yet retain the qualities that will commend them to the great orange-eating public.

MARKETS.

Fruit-growers have long since realized that they may grow fruits successfully, cheaply, and in abundance; but, owing to many and various causes,

the financial result may be a failure, from his inability to secure a market, or, if secured, the cost of placing them absorbs the entire value of the shipment, and sometimes requires an extra assessment to pay freight charges and commissions. As with the deciduous fruits, so with the citrus fruits, there are many localities producing the most delicious oranges, but entirely too tender for transportation to distant markets. In Fayal and Treceira it has ceased to be exported, not being able to compete with oranges sent from other countries in the markets of England, the only markets really within reach of so delicate a fruit.

Humid atmospheres and localities along the sea-shores produce this character of fruit, while the more elevated and arid sections produce a fruit equally rich in flavor, but of a tougher texture of skin, able to bear rougher usage and longer transportation. Another point to be considered in regard to markets, especially of the United States, is its appearance in the markets in competition with deciduous fruits, and the seasons best adapted to its use.

From July to December the great variety of deciduous fruits crowd the markets, and hence at this time the demand for citrus fruits is usually quite limited. Again, from December to March, throughout the northern states, a prevailing temperature considerably below zero materially interferes with the transportation and also discourages the use of oranges to a great extent. It is, therefore, only from March to July, when the increasing temperature, especially in malarial districts, makes this fruit so desirable, that the great demand usually exceeds the supply, and the profit enures to those localities that can promptly meet it.

Much has been said as to prices and profits of citrus fruit-growing, gathered from many localities. Suffice it to say that in Italy and the eastern shores of the Mediterranean the profit is quoted at $80 to $150 per acre. Taking into consideration the known longevity of the tree and its wonderful capacity for producing fruit under favorable conditions—some 20,000 to 38,000 specimens from a single tree—it must be admitted that it is an exceedingly profitable branch of fruit-growing. A seedling orchard of eighty trees per acre, in full bearing, producing an average of 3,500 specimens—about twenty boxes—could be sold for twenty-five cents per box upon the trees, and realize to the owner some $400 per acre; and the cost of caring for such an orchard in cultivating, irrigating, pruning, including the price of water, would not exceed $35 per acre.

In conclusion, it must be said that, while this fruit is grown in the exceedingly favorable localities named, yet, as a great commodity of commerce, the principal supply is furnished by points in the Mediterranean below the 38th degree of latitude. On this continent, on the Atlantic coast, its successful culture is below the 30th parallel; while on the Pacific coast, so far, it is below the 35th parallel; but, as I have stated in the beginning of this article, the Anglo-Saxon has put his "hand to the plow," and no one is wise enough to limit his powers in this direction except by an arctic zone.

Prof. Van Deman, U. S. Pomologist, Washington—I wish to make a few remarks about sports spoken of in Mr. Rudisill's paper. Frequently such eccentricities and freaks are discovered in the blossoms of plant life. It would be interesting, and of subsequent value, to watch these sports closely, as by so doing choice varieties of new citrus fruits might be developed.

Mr. Bradbury, of California—I am sorry Mr. Rudisill has not had more to say of the importance of irrigation. In California, and especially Southern California, irrigation is absolutely essential to success in connection with crop productions. It is a subject of such paramount importance that it demands the attention of practical as well as scientific men.

On motion, the Society adjourned to meet at 7:30 P. M.

Sixth Day—Thursday.

EVENING SESSION.

The last session of the American Horticultural Society convened in the assembly room of the Congregational Church, in the city of Riverside, Cal., at 7:30 P. M., February 9, 1888, President Earle in the chair.

President Earle, of Illinois—I desire once more to allude to the important work this Society is doing. It is eight years since its organization as the Mississippi Valley Horticultural Society. The object of its organization was the promotion of all branches of American horticulture. It soon became evident that it had outgrown the limits of the great central valley of this continent, and its name was changed to enable it to reach out and take in adjoining territory. Four valuable volumes of transactions have been published, and each has met with a most cordial welcome from the horticultural world. Volume V will be the proceedings of these meetings here in California. A complete set of these reports will be of great value, and worthy to adorn any library in the land. A very few complete sets can yet be supplied by our Secretary, who will mail them to any address on receipt of $1 per copy. Our programme for this evening is short, and will mainly consist in listening to the lecture of Dr. J. C. Ridpath, whom I now have great pleasure in presenting to you.

THE TRUE EVOLUTION—WHAT IT TEACHES AND WHAT IT DOES NOT TEACH.

BY J. C. RIDPATH, LL.D., OF INDIANA.

[NOTE.—The Secretary regrets his inability to give more than a brief synopsis of this exceedingly interesting lecture. The following is copied from one of the city papers, and will convey only a vague idea of the scope of the lecture.—SECRETARY.]

Professor Ridpath, being introduced, said, in substance, that it was nearly thirty years since one of the greatest books of our century was published on the subject of evolution, and since that day about three hundred and twelve volumes had been issued on that subject, with a view to establishing by proof the hypothesis of the evolution of life as an expression of the *modus operandi* of those phenomena.

The natural history of life is a subject which can hardly fail to interest all classes. The man of the orchard and the garden, the man of the shop and farm, the man of the laboratory, must all alike be charmed by the history of those phenomena we call life.

What, then, is the natural history of life? what the law and forces which determine its epochs and destiny? and what, especially, is that universal all-comprehensive phenomenon by which all life, as well as all human institutions, has come into its present form of development? The speaker meant, of course, the hypothesis of evolution from the lower into the highest forms of existence.

He took it that the truest and most general expression of the true law of evolution, as applied to the forms of life we see around us, was that the life of every species of things in the vegetable and animal kingdom is epitomized in the life of the individual of that species. The history of every species of living organism is summarized in the history of the individuals which compose it. The same process of growth which we observe in every organic life in its germinal state to its complete development has gone on and still goes on in the species.

The individual begins in the germ; the rest of his career is determined by the laws of evolution. His organs expand; he enters the state of consciousness; perhaps from being prone on four feet he rises and walks. He looks about him and beholds the boundary of the natural world. It reacts upon his senses, and he begins to acquaint himself with the laws of his environment. He discerns the life of infancy in others, and he conjectures that his own was the same. He reasons, imagines, and, perhaps, dreams; he grows old; he dies, and the record closes with this—*he was.* His life was the life of the species.

The professor enlarged upon this view. He applied the germinal beginning to the earth and the growth of the plant. At one time the earth did not weigh ten pounds, but, like everything regulated by the God of nature,

it grew. Society grew, institutions grew, governments grew. It was wrong to suppose that the wise fathers of a hundred years ago created—made—the constitution. It grew. The germ was formed in European oppression and came to this country.

The lecture was an exhaustive consideration of evolution, and at its conclusion was warmly applauded.

President Earle—As a rule, I am not favorable to votes of thanks, but if ever this Society was placed under obligations to any person for contributing to its entertainment, it certainly is now to Dr. Ridpath for his scholarly and entertaining lecture. This is certainly one of the richest literary treats which I have ever enjoyed. The Society, by a unanimous vote, extended its thanks to Dr. Ridpath for his lecture.

Treasurer Evans, of Missouri, presented W. H. Ragan a purse of $160 in gold, the gift of members of the Society, in acknowledgment of his long and faithful services as Secretary.

The following paper (slightly abridged), by one of California's most extensive olive-growers, was presented, and, for want of time, referred for publication without reading.

OLIVE CULTURE.

BY HON. ELLWOOD COOPER, OF SANTA BARBARA, CAL.

The common method of propagating the olive is to plant cuttings from three-quarters of an inch in diameter to one and a half inches, and from fourteen to sixteen inches long. These cuttings should be taken from the trees during the months of December and January. They should be planted in permanent sites in February or March, depending upon the season. In Santa Barbara, near the coast, no irrigation is necessary, but very frequent stirring of the top soil with hoe or rake for a considerable distance around the cuttings is necessary during the spring and summer. About three-fourths of all that are well planted will grow. My plan is to set them twenty feet apart each way, and place them in the ground at an angle of about forty-five degrees, the top to the north. By planting them obliquely the bottom end will be from ten inches to one foot below the surface. In Europe the trees are planted from twenty-seven to thirty-three feet apart. The cutting will throw up numerous shoots or sprouts, all of which should be left to grow the first year. It will be advisable, however, where there are two or more vigorous shoots of about equal size and height, to pinch the tops of all excepting the one to be left for the future tree. In the following spring,

when the ground is warm and sufficiently dry, all sprouts, excepting the one to be preserved, should be carefully removed. In pruning during the first years have only one object in view, that is, to force all growth into one main trunk. This being done, the tree will naturally form a beautiful shape. All branches to the height of five to five and a half feet should be removed, so as to admit of close cultivation by horses.

Trees grown from cuttings will produce fruit the fourth year, and sometimes, under favorable circumstances, a few berries the third year. The habit of the tree is to overbear, and as a consequence will give but little fruit the year following a heavy crop. There are, however, exceptions to this rule in California. Mr. Davis, who had charge of the San Diego Mission orchard in 1875, assured me that he had gathered from the same tree two years in succession over 150 gallons of berries. I have also observed that some trees in my orchard have borne well successive years. Fruit-bearing can be controlled by proper pruning. The cultivator will not forget that the shoots or branches must be two years old before they will give fruit; hence, partial pruning every year will give partial crops. My oldest orchard was planted February 21, 1872. At four years I gathered from some trees over two gallons of berries, and in 1878 over thirty gallons each off of a few of the best trees. The tree mentioned in the San Diego Mission orchard as yielding 150 gallons of berries was more than fifty feet distant from those surrounding it. Our climate is congenial to the olive; it blooms from the 1st to the 10th of May. At this season we have our best weather, free from the extremes of either heat or cold. Nowhere in the world are all the conditions so favorable to perfect fruit-bearing.

The olive usually ripens in November. In Santa Barbara the crop of 1880, as also that of 1878, was unusually late in ripening, not being ready to pick before the middle of January—a delay of fully two months, the cause, no doubt, owing to the extraordinary rain-fall of these two years. The fruit should be gathered as soon as it turns purple, and before fully ripe, as the oil will be lighter in color and more fragrant, but somewhat less in quantity. In Europe the common method of gathering the berries is to knock them from the trees with poles. This plan has serious objections; the fruit being more or less bruised causes decomposition, and the contact with the earth is liable to give the oil an unpleasant taste and odor. I have arranged on a wagon platforms, with ladders securely fastened, so that the fruit can be gathered from the wagon, which is driven along the rows. Leaves and imperfect berries are separated by passing the fruit through a winnowing mill. This process leaves the fruit in the best possible condition for manufacturing the oil. The berries are dried before crushing. If, however, they are left on the trees until shriveled, no drying is needed after picking. By artificial heat the necessary drying can be done in less than forty-eight hours. Crushing and pressing should follow without delay--that is, the fruit taken from the drier in the morning should be crushed and pressed the same day. All fruit picked during the day should be in at night, cleaned the following

morning, and go into the drier immediately after. The temperature of the drier ought to be so graded as to complete the work in forty-eight hours, and the limit of heat should be under 130°. Economy will necessitate a system in the different branches of the process admitting of no delays from the beginning to the end.

The almost universal method of crushing the berries is by a heavy stone, similar to a millstone, which is rolled around on the edge in a deep circular groove or trough, and by its weight does the crushing. A beam passing through the eye of the stone, and working on a journal in the center of the circle, with a horse attached to the outer end of the beam, is the simplest way to do the work. To make one hundred gallons of oil each day would require two good presses. The crushed olives are put in the press in cheeses about three feet square and three inches thick, with wooden slats between each cheese. Ten or more cheeses can be put in at each pressing. I use coarse linen cloth to contain the crushed olives. The fluid that is expressed is put in large tanks and left for from sixty to ninety days, when the oil will separate, and, being lighter, will rise to the top, where it can be drawn off. The pomace, after the first pressing, is recrushed, and, by pouring hot water over it, a second pressing is made.

The most common method of filtering, or clarifying, is to have a series of five or six boxes, one above the other. I use cylindrical tin vessels, holding about three gallons each, one fitting in the other in tiers of three, with fine wire sieves in the bottom of each. On these sieves I place two or three layers of cotton-batting. The oil is passed from one tier to the other until clear. It should not be exposed to sunlight or heat; neither should it be handled any more than is absolutely necessary in the filtering and bottling, and it should not be shaken after bottling. The mucilage contained in the oil will not separate for a long time after the oil is ready for use, and, as it does not injure it, is not, therefore, objectionable. It will sometimes form in the bottles like globules of water, or in films settling to the bottom as sediment, and, when shaken, will give it a muddy appearance, which, with the common prejudice against all table oils that are not perfectly clear, renders it unsalable. The oil is better when new and fresh, and what is gained in the appearance by its remaining a longer time in the tank is more than lost in its freshness and delicacy of flavor.

There are different methods of preparing the fruit for pickles. The one adopted in Santa Barbara is as follows: The berries are put in fresh water, which should be changed every day for forty or fifty days; then put in salt brine, not very strong, and, after remaining a few days, drawn off, a second brine substituted, made nearly strong enough to bear an egg. Keep the olives well covered with the brine. Great care should be taken in handling the berries not to bruise them. The easiest plan, when picking from the tree, is to drop them in water. They are usually picked when they begin to turn a purplish color. Another method is to "pick the olives as soon as they begin to show a reddish cast and rinse them in clean water.

Then take one ounce of concentrated lye and dissolve it in water. To one-third of this solution add water enough to cover one gallon of olives. After a day or two pour off this water and add another lye of the same strength. This may be repeated once more, as five or six days are consumed in taking out the bitterness with the lye. The lye should be used until the fruit suits the taste. Then the olives are put in pure, fresh water until the alkali is well removed. This can be ascertained by the color of the water and by the taste. In salting, use about ten pounds to the barrel of olives, water enough being used to cover the fruit. Barrel up tight and keep in a cool place. The process should be conducted in the dark, as the light is apt to injure the color. The celebrated olives pickled after the manner of Picholini are put under a treatment of lye made more alkaline by the addition of quick-lime. After leaving the olives a certain length of time, until the pulp separates easily from the seed, a condition which depends upon the strength of the lye and the size of the olives, they are then washed and put in strong brine."

My attention was called as early as 1874 to the condition of the trees in and around Santa Barbara from the ravages of the *coccus oleæ*, commonly known as the black scale, and which was always followed by the black fungus. An olive tree once attacked with the scale bug, unless cleaned, will soon be infested so that it can not bear fruit.

Pruning is the most essential thing, and the remedy of the greatest vital importance. If trees are properly pruned, so as to admit of free circulation of air and the sunlight, more than half the battle is gained. In fact, trees in such condition, where the ground is well tilled and kept free from rubbish, are not so liable to the attack, and if attacked each scale insect can readily be seen, and should be removed without delay. Orchardists who adopt this plan will have very little trouble, even in badly infected districts. The insects will be found to inhabit that portion of the tree where the foliage is most dense, where the sunlight is shut out, and free circulation prevented. There is not so much in the remedy as in its application. While certain remedies may be effectual in the hands of some, in the hands of others they will not be sufficient. Constant watching and constant fighting is the only sure plan to prevent the spread of insect pests in localities where trees are affected. The remedy that I have finally adopted as being the most effectual is the application of kerosene-oil.

The olive will thrive and do well in almost every part of California, and, while there may be fruits that yield better incomes, no tree offers so much and so certain as a permanent investment. Oil-making can not be overdone. The demand for olive-oil, at good prices, must increase more rapidly than the production. But those who embark in the business must remember that no trees require greater care to insure profit. In olive-growing we are independent of high-priced labor, the picking being done in the winter time after all other fruits are gathered. We are, comparatively speaking, independent of the freight question, as the value is great in small bulk. The fruit is not perishable.

I have visited at Santa Rosa the hills of Captain Grosse, where he has probably five or six thousand trees, two years old from planting, and I must say that he deserves great credit. He has conferred a lasting boon on the people of Santa Rosa, clearing land that, to my eyes, was absolutely worthless, and planting olive trees. These olive trees on the ridge of the hill are probably not more than from five to ten rows wide, following the shape of the hill, and in that respect there will be a great advantage in regard to insect pests, because they will have better circulation of air and more sunlight.

I have growing on my place olive trees in the black adobe, in deep bottom land, in sandy land, made from the wash of the mountains, in stony hill-sides and adobe hill-sides, and in table-land, where the subsoil is probably twenty feet deep, dark clay, and, so far as I have known, there is no difference in the bearing of these trees, or in the oil made. The only test I have ever made in regard to the quantities borne by an orchard showed 122 pounds of olives per tree throughout the orchard, the trees being seven years old from the cuttings. The best result in making oil has been twelve and a half pounds per tree; the poorest, ten and fifty-five hundredths pounds. I could not say whether this was caused by the different years, or by less care in drying. We have for the tree seven years old at least ten bottles of oil, and those bottles will sell readily anywhere at $1 apiece.

We commence picking in December, as soon as the olives turn a purple color—some of them probably only a reddish color, with one side partially green. They then require more drying than if picked in the months of March and April, when the water will have evaporated mostly from them. The oil is of a lighter color if made earlier than it is later in the season, but in practice we make it all in the same tank, and I do not apprehend that there is very much difference as to the color of the oil, nor as to the quality. In Europe they dry the berries almost altogether in the sunlight. In the coast counties here that is impossible, because we may have a series of foggy days during the process of drying, and then it would be impossible to carry on the work.

I have spent probably a dollar to a dollar and a half a tree each year in fighting the black scale, and can only barely keep it in subjection at that. This black scale seems to have been created for the olive, to make us careful, energetic and persistent. While one washing each year with kerosene emulsion will keep an orange tree, a lemon tree or a lime tree free from the scale, the olive tree requires two or three or four washes to have the same result. My orange trees are just as clear and clean as those grown at Riverside, where they have no black scale at all. Of course, there are insects there on the inside, but they are easily kept down by washing with the kerosene emulsion once a year. On the olive tree, I confess I do not know yet the proper time of year to do this washing. For two or three years we have had so much rain in the winter time that I could not get on the ground. Our wagons were so narrow in the tire, and the ground so soft, that there

was no possibility of getting a washing apparatus over the field, but now I have wagons made with the tires six and eight inches wide, so as to be independent of the soft state of the ground; and this winter I am going to practice, in the months of December and February, washing with the kerosene emulsion, to see whether it will not be more effective than it has been applied later—in April and August. The insects commence hatching in June, and if they would all hatch out in June or in July it would be an easy matter; but I have known them to hatch as late as the month of February, and while simple washings will kill the little ones after they are just hatched, it will not affect those that are half grown. If you defer the washing until after they are all hatched, the first hatching is more than half grown, and has already formed its shell and affixed itself. That is the great difficulty with the black scale; it has but one brood a year, but that brood takes four or five or six months to appear upon the scene.

FINAL RESOLUTIONS.

WHEREAS, The members of the American Horticultural Society have been cordially received by the citizens and Board of Trade of Riverside, and many courtesies extended them in a reception at their citrus fair, a grand drive through their unexcelled orchards, and a most pleasant house for our meetings, therefore we most heartily tender them our sincere thanks. We also desire to, and do, thank the press for so freely advertising our meetings here, and publishing reports of our proceedings.

T. V. MUNSON.
S. JOHNSON.
H. I. BUDD.

The report was heartily concurred in by the Society.

A motion to adjourn *sine die* was adopted.

Before announcing the vote, President Earle said:

I hope we shall meet again, that you will come and meet with us at our various meetings at the East, and that perchance we may even some time come across this long continent—this broad continent—once more to meet with you. This Society has done much since its organization—very much—to promote the interests of horticulture in this land. We have done it in many ways—in our meetings, in our published reports, and in the exhibitions we have created. Our first meeting was connected with the largest exhibition of horticultural products that at that time had ever been held upon this continent, and this Society organized and carried forward to completion the greatest of all horticultural exhibitions that has ever been held in the world, at the World's Fair at New Orleans. It was entirely organized and maintained by this American

Horticultural Society. I was told by a gentleman thoroughly conversant with the facts that he believed, and had good evidence, that the exhibits that California made in the Palace of Horticulture at New Orleans had turned into Southern California alone more than thirty millions of dollars since that time—a result which can be set down to the credit of this Society. That fair was not alone in the interests of Southern California, but in the interests of industry in the southern states and the northern states. But I can not dwell upon this. In parting, ladies and gentlemen, I think I voice the views of the members of the Society when I express thanks for the cordial and hearty manner in which we have been received throughout the length and breadth of California. The American Horticultural Society is now adjourned.

MEETING OF THE EXECUTIVE COMMITTEE.

At the close of the sessions of the Society, the Executive Committee was called to order. Present: President Earle, Vice-President Munson, Treasurer Evans and Secretary Ragan, and State Vice-Presidents Thomas of Arkansas, Budd of Iowa, Johnson of Indiana, Holsinger of Kansas, Samuels of Kentucky, Elliott of Minnesota, Goodman of Missouri, Barnard of Nebraska, Lewers of Nevada, Budd of New Jersey, Hubbard of New York, Lindley of North Carolina, Hewson of Nova Scotia, Ohmer of Ohio, Cardwell of Oregon, and Smith of Wisconsin.

The Secretary reported the names of 450 members now enrolled.

The Secretary was directed to publish 1,000 copies of Vol. V.

A motion was adopted authorizing the Secretary to sell full sets of past volumes (Vols. I, II, III and IV) for $4 per set so long as the supply lasts.

Dr. J. C. Ridpath was allowed the sum of $50 for assisting the Secretary at the late meetings of the Society.

The Secretary was authorized to draw warrants on the Treasurer for such amounts as have been allowed by the Society at its recent meetings.

There being no further business, the Executive Committee adjourned.

AGRICULTURAL AND HORTICULTURAL PRESS.

The following journals and magazines and many others have placed the Society under obligations by numerous friendly references, and some of them by their regular visits to the Secretary's office. To this list might (were it here appropriate to enumerate them) be added a large list of secular papers which are also entitled to the thanks of the Society for many favors and flattering notices:

Agriculturist, Racine, Wis.; *Agricultural and Horticultural Journal*, Chicago, Ill.; *American Garden and Floral Cabinet*, New York; *American Agriculturist*, New York; *California Fruit-Grower*, San Francisco, Cal.; *Canadian Horticulturist*, St. Catherines, Ont.; *Colman's Rural World*, St. Louis, Mo.; *Country Gentleman*, Albany, N. Y.; *Drainage and Farm Journal*, Indianapolis, Ind.; *Eastern Farmer*, Augusta, Me.; *Farm and Home*, Springfield, Mass.; *Farm and Garden*, Philadelphia, Penn.; *Farmers' Home Journal*, Louisville, Ky.; *Farmers' Review*, Chicago, Ill.; *Farm and Fireside*, Springfield, O.; *Farm Journal*, Philadelphia, Penn.; *Florida Dispatch*, Jacksonville, Fla; *Fruit and Grape-Grower*, Charlottesville, Va.; *Fruit-Growers' Journal*, Cobden, Ill.; *Garden and Forest*, New York, N. Y.; *Green's Fruit-Grower*, Rochester, N. Y.; *Horticultural Art Journal*, Rochester, N Y.; *Horticultural Times*, London, Eng.; *Illustrated Pacific States*, San Francisco, Cal.; *Indiana Farmer*, Indianapolis, Ind.; *Industrialist*, Manhattan, Kan; *Journal Columbus Horticultural Society*, Columbus, O.; *Journal of Agriculture*, St. Louis, Mo.; *Kansas Farmer*, Topeka, Kan.; *Maine Farmer*, Augusta, Me.; *Nebraska Farmer*, Lincoln, Neb.; *New England Homestead*, Springfield, Mass.; *Northwestern Farmer*, Portland, Ore.; *Orchard and Garden*, Little Silver, N. J.; *Our Country Home*, Greenfield, Mass.; *Ohio Farmer*, Cleveland, O.; *Pacific Rural Press*, San Francisco, Cal.; *Popular Gardening*, Buffalo, N. Y.; *Prairie Farmer*, Chicago, Ill.; *Rural Californian*, Los Angeles, Cal.; *Rural Home*, Rochester, N. Y.; *Rural New Yorker*, New York, N. Y.; *San Diego Magazine*, San Diego, Cal.; *Southern Cultivator*, Atlanta, Ga.; *Texas Farm and Ranch*, Dallas, Tex.; *The World*, New York, N. Y.; *Tree-Planter and Fruit-Grower*, Elgin, Ill.; *The Citrograph*, Redlands, Cal.; *Western Farmer*, Madison, Wis.; *Wine and Fruit-Grower*, New York, N. Y.

[NOTE.—The Secretary reluctantly omits the usual "roster of officers," in view of his inability to secure such data as would warrant him in claiming for it even approximate correctness. This is partly due to the indifference of officers of the several societies in making their reports to the Secretary, and to the overwhelming amount of labor required in obtaining correct lists.—SECRETARY.]

APPENDIX.

EXPLANATORY NOTE.

The following sketch by Professor J. C. Ridpath, LL. D., while not strictly and legitimately a part and parcel of this report, seems so admirably fitted to follow, if for no other purpose than as an embellishment to the volume, that the Secretary herewith presents the same, believing that all will read with interest, especially those who were of the fortunate numbers that accompanied the Doctor *across the continent* and through the golden valleys of California.

SECRETARY A. H. S.

BEYOND THE SIERRAS:

A TOUR OF SIXTY DAYS

THROUGH THE

VALLEYS OF CALIFORNIA.

— BY —

JOHN CLARK RIDPATH, LL. D.;

AUTHOR OF A HISTORY OF THE UNITED STATES, A CYCLOPÆDIA OF UNIVERSAL HISTORY, ETC., ETC.

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TO THE OFFICERS AND MEMBERS

OF THE

American Horticultural Society.

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BEYOND THE SIERRAS.*

CHAPTER I.

EN AVANT.

The Rendezvous.—The Start.—Land of the Creeks.—Denison.—First Reception.—To Fort Worth.—The City.—Westward Bound.—Dunder and Blitzen.—Landscapes of Western Texas.—El Paso and Paso del Norte.—Tor-r-ro!—Across the Gadsden Purchase.—The Arizonian Plateau.—Tucson.—The Sage-Bush.—The Marquis of Leap.—Giant Cactus.—Shining Atmosphere.—Adobe Villages.

It has fallen to the part of the writer to put into form for the present volume some observations relative to the recent excursion of the American Horticultural Society to the Pacific coast. He is not certain that within the limits of a few chapters he shall be able to present even an adequate summary of the many objects of interest, and the thousand recollections and comments that rise to view whenever this great tour or overland voyage of the Society is mentioned. On the whole, it is doubtful whether any other company of people of equal numbers and equal abilities to see and to learn, to appreciate new conditions, and to estimate the value of the new facts and phenomena peculiar to the vast regions constituting the western borders of our country, have ever had such an extended and favorable opportunity for taking in an almost infinite variety of scene and circumstance, or have more fully enjoyed the advantages thus arising, than have our membership in the case of their California excursion.

The present work will, of course, be confined to general views, and to such comments and observations as sprang from the larger facts of our tour, and will drop into details only as it respects certain particular parts of unusual interest. It will not be expected that the writer has in all cases himself been most interested and instructed with the same facts and conditions that have appealed most strongly to other and more observant members of the company; but since his office is to make a picture of the whole, the drawing must be, of course, after his own conception, and the coloring from his own poor assortment of tints and pigments.

As has been stated in the opening paragraphs of the present publication,

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the biennial meeting of the American Horticultural Society for 1888 was planned to take place at the two cities of San José and Riverside, California. The sessions were to cover a space of six days—the first three being the 24th, 25th and 26th of January, at San José, and the last three the 7th, 8th and 9th of February, at Riverside. From the very first the reader must begin to make a liberal allowance for distance, and this is, at the beginning, brought forcibly to his attention by the fact that the two California cities which were to be the termini of the excursion are no less than 570 miles apart

In arranging the excursion, it was provided that the rendezvous of the various groups of members and their friends should be at Kansas City, on the 12th of January. A great many persons outside of the Society availed themselves of the opportunity offered by it to make a journey to the Pacific coast. These, however, were quite exclusively a superior class of people, who amalgamated well with the members of the Society, so that the company as a whole, large as it was, and representing as it did so many districts of our country, was especially homogeneous and friendly from the start.

It happened that the ingathering of the excursionists was coincident in time with the oncoming of the first formidable snow-storm of the winter. Nearly all who left their homes on the 10th and 11th of the month did so in pleasant weather, but the gathering in Kansas City on the morning of the 12th was in the midst of a tempest of snow-flakes, portending still more serious conditions in the atmosphere.

When it came to make up the trains, it was found that no fewer than twenty-five Pullman coaches were required for the accommodation of the excursionists; nor was there any unoccupied space. The company was fully as large as the room which had been provided for it. The train was made up in three sections, and late in the afternoon of the 12th headed for the south and west. The routes which had been determined on were: outward-bound, the Missouri Pacific from St. Louis, via Kansas City, to Fort Worth; the Texas & Pacific from Fort Worth to El Paso; and the Southern Pacific from El Paso to San Francisco and other points of destination. On the return, either of several routes might be selected. Most of the excursionists expected to return by the Atchison, Topeka & Santa Fé; others, by the Central Pacific and Union Pacific to the points of departure; others, still, by the Central Pacific and the Denver & Rio Grande. The option was even extended of coming home by way of the Northern Pacific; but, owing to the season, few, if any, availed themselves of this provision. It should be said, once for all, that the arrangements made by the officers of the Society and railroad officials for the transportation, the comfort and advantage of the excursionists, both in going and coming, were all that could be desired.

In making a voyage of two or three thousand miles by rail, the traveler must content himself with riding half the distance through tunnels. Every night is a tunnel. With the coming of evening, the voyagers plunge into darkness, and for the next twelve hours the outer world is as though it were not. With the coming of morning, exit from the tunnel. The scene is

reversed. The attention of all is directed to the external landscape, and for the twelve hours ensuing each tires his senses with observation of the varying scenes through which he whirls along, or stores his memory with such facts and fancies as have pleased him most.

Our first twelve-hour tunnel reached from Southeastern Kansas to the central part of the Indian Territory. The morning of the 13th found us in the country of the Choctaws and the Creeks. The scene had already changed from the conditions out of which we had come. An occasional village of the red men took the place of the accustomed country station, with its postmaster, its express agent and its company of loafers. The red man, however, is not above loafing with the rest of us. At the time of our passage through he was also enjoying the advantages of another peculiarly American virtue. He was in the midst of an election. This is said of the Creek nation. The citizens of that commonwealth had just closed the polls after a great contest in the choice of a governor. The writer was surprised to learn, in a conversation with ex-Governor Perryman, of the Creeks, that the issue involved in their election was also peculiarly American. It was a kind of state rights or nationality question. With this, also, was mixed up a certain amount of bloody shirt. It seems that some of the civilized Indians of the territory were, in their antecedents, strong Union men, while others had sympathized with the Confederates. It is true, moreover, that the questions thus arising have their roots in old differences of tribal organization existing among the Indians before the present order was established. This is to say that, in the most ancient times, the Indians were strongly state rights in their methods and proceedings. The nations were broken up into tribes, and every tribe did as it would. From all that I could gather from the ex-governor, it would appear that the Indian races of the territory are greatly in need of some Hamilton or Madison to set them right in the fundamentals of politics.

On the afternoon of the 13th the sections of our excursion drew up at the first major point of the journey, that is, Denison, Texas. Here arrangements had been made for a reception of the Society by the authorities and people of the city. A sufficient reason for this courtesy could be found in the fact that Denison is the residence of that most genial, able and popular gentleman, Mr. T. V. Munson, Senior Vice-President, past, present and future, of the Society.

Denison chooses to call herself the Gate City. This is to say that here the traveler passes as under an archway, and enters the empire of Texas. The city has a population of about 15,000, and is rapidly growing in extent, enterprise and wealth. She is fairly specimental of what the jargon of our times calls the New South. One of the characteristics of Denison is the activity displayed by her merchants, business men and citizens. It is a handsome place, and the inference is easily drawn that the city is backed up by a region of great productive resources. Here are situated some of the shops, including the great round-house, of the Missouri Pacific Railway; and it should be mentioned that on the night after our departure the last-named

structure was consumed by fire, together with twenty-three of the stalwart engines belonging to the company.

There is coal in this country, and the rumor of coal. Much manufacture, large fruit-growing interests, and many other elements of prosperity, are discernible to the actual eye; and there is much more to the eye of faith. The Texan of this region has a good eye of faith, and his ear is of that variety which hears the tramp of the coming millions. All this is to say that Denison, as well as many other places in the Lone Star State, has a vast and vigorous boom; and to the casual observer her people seem to be preëminently worthy to enjoy its advantages.

The reception of our excursionists had been prepared under the auspices of the North Texas Horticultural Society. Garner & Haynes' Hall was selected as the place for the reception and banquet. As soon as the three sections of the excursion train had reached the station a committee of reception met and conducted the Society to the commodious hall, where, under the direction of the ladies of the city, eighteen tables, all crowned with flowers, groaned under the weight of the banquet which had been prepared for the city's guests. Three evergreen mottoes adorned the walls: "Welcome to Denison," "Texas, the Lone Star State," "Welcome to our Guests." Fruits and blossoms were heaped on every hand, and the handsome ladies of the city stood ready to serve the guests. The entertainment and banquet the first of many which we were destined to enjoy, were as generous as this favored region of country and the liberality of the citizens could make them. The banquet was hardly ended at night-fall, and an evening reception was added. The music and dancing were continued until the hour of departure.

We have now arrived at that great North American necessity—the making of speeches. In the afternoon the guests were welcomed to the city and the banquet by Hon. Samuel Hanna, mayor of Denison. A brief address was made by a member of the Society in response. In the evening, while the entertainment under the auspices of the Choteau Dancing Club was on, formal resolutions by the Society were read by Mr. Sylvester Johnson, of Indiana. These were enthusiastically adopted. Cheers were given for the ladies of Denison, for the city, for Texas, and for whatever else was reckoned worthy of a cheer; and the entertainment concluded at eleven in the evening. As the excursionists gathered into their berths, and the hum of excitement subsided, the Titanic engines headed away to the west of south for Fort Worth. As the last section was drawing out from the station, an alleged poet, who chanced to be among the excursionists, handed to the editor of the *Sunday Gazetteer*, the following stanzas, as expressive of the sentiments with which the guests of Denison took leave of her hospitality:

OUR ANSWER.

I.

How brighter is the traveler's devious way,
For friendly faces and the warmth of meeting!
The grateful hand records the hour and day
And memory of every gracious greeting.

II.

For us this night the fair Gate City throws
  Her portals wide; she spreads her fruits and flowers
For stranger guests, escaping from the snows;
  She makes her sunshine and her blessing ours.

III.

From borders far the gardener is here,
  The man who prunes, whose trees bring daily duty;
Your Lone Star meets him with a feast and cheer;
  Her mistletoe is his from hands of beauty.

IV.

Not ingrate we, not quick to taste and go;
  Not idly at your feast our sense regaling;
But bearing with us to the overflow
  A cup filled ever from a source unfailing.

V.

And this we seek in other days from you--
  Some look cast backward from the far hereafter--
Some thought for us, as ours for you is true,
  Of this fair night of welcome, dance and laughter.

VI.

Oh, men and women of this southern land,
  Oh, sons and daughters who have smiled and spoken,
Receive our hearts, in trust, with parting hand,
  And be your peace a day-dream never broken.

The night journey of the 13th brought us to Fort Worth. By the courtesy of the weather clerk we had enjoyed sunshine and balmy air during our afternoon in Denison. Of this, however, we took a sudden leave, and by the time of our arrival at Fort Worth had plunged into what may be called a spell. The city was spattered with rain and mud, but, under cover of the dismal morning, it was easy to see that the place was one of great enterprise and progress. From a manufacturing and commercial point of view it is likely that Fort Worth leads all the Texan cities. It is substantially built, with broad streets and some attention to sidewalks. At Fort Worth the Society had no reception. Some preparations had been made for a considerable stop and a drive about the city, but certain delays of the train, the intolerable splutter of the rain-storm, and other untoward circumstances, defeated the project. So, for some hours, the most venturesome of the excursionists beat about the principal streets, while the timid were glad to remain in their Pullmans, reflecting on Noah's flood.

It should be said that the country which we had traversed thus far from Kansas City to Fort Worth is almost continuously beautiful and fertile. The

scarcity of timber and of water-courses strikes the attention of those who have been accustomed to plentiful distribution of these benefits; but the mind immediately reverts from the disadvantages just named to the grand expanse of prairies, still matted with last year's grasses, and suggesting a reserve of productive power in comparison with which the puny resources of our smaller fields and pastures in the Middle and Eastern States are as nothing to infinity. Of the regions thus far traversed, the Indian Territory surpasses in beauty, while Texas excels in the promise of production and wealth.

At Fort Worth our trains were whirled onto the tracks of the Texas & Pacific Railway. Our engines set their Titanic eyes toward the sundown, and we were off on our journey along the longer diameter of the Lone Star State. It was from this time forth that new ideas, never to be effaced, of the imperial expanse of our western country, of its limitless horizon and boundless skies, were impressed upon us. No one who, for ten hours together, on the rapidly flying train, sits by the window of the coach and gazes out on the spreading prairies and far-off horizon of the Texan landscapes can ever forget the impression of sublimity and infinite extent which they leave upon him. One must needs hear the voice of prophecy and the murmurs of a half-audible apocalypse as he views the scene, and dreams of the coming ages.

A strange experience, however, not wholly agreeable and totally unexpected, awaited our excursionists as they traversed the Texan plains. Mention has been made of that immense snow-storm which blustered and roared around us on our way from Kansas City to the south. Out of this we emerged in the southern part of the Indian Territory and through the first stages of our Texas pilgrimage. But a low barometer, striking the United States very anomalously about a thousand miles west of Manitoba, at a place called Medicine Hat, and sweeping down the Rockies as far as Cheyenne, whence its course was deflected to the east, had, in the mean time, got in its work; and a ferocious blizzard of cold and snow, howling like a grizzly bear out of the Yuba mountains, came rushing after, striking Texas squarely in the side, and, in a tornado about fifty miles in breadth, swept on to the south, until its boreal mane of icicles and sleet was melted off in Mexico.

Through the pathway of this monster, at right angles, the three sections of our train were obliged to pass. It struck us on the northern side. The heavy Pullman coaches rattled in the blast. The thermometer went down into the cellar. At Abilene a piece of frozen mercury hanging by the door of the eating-house said something about 10° below zero. But the temperature might well have been borne by people inured to cold had it not been for the accompanying storm. The writer has had the pleasure and excitement of several blasts in his life, but he deliberately declares that of all the bitter, biting tornadoes that ever he was struck withal, the most terrible and merciless was that which gnawed his overcoat and bit off his beard on the night of the 14th of January, out on the Texas Pacific. Our people suffered severely. Women cried with the cold, and some of their husbands used

language. Numbers of the excursionists lay awake all night in their berths shivering and shuddering. Thus did the writer, who, in his desperation, offered the porter of the Anchoria twenty-five cents apiece for every article which he would pile on him during the night. One passenger, putting his hand on his frozen forehead, said he thought he was dead. Another, when a hot box was announced, suggested that it be put in his berth for five minutes! Another said that he never had until then discovered the advantage of Elijah's going to heaven in a chariot of fire. But the bitter night went by, and by ten o'clock of the following morning the trains had swept out of the blizzard, the most terrible ever known in Texas, and had found again sunshine and genial air.

By the time the traveler on his way to the Pacific coast reaches the western parts of Texas he has sufficiently ascended the great plateau to bring him into new classes of phenomena. By this time nature has changed her aspect; the elevation above the sea has become so great as to give to the atmosphere that shining transparency which he has never seen before. Distant objects begin to draw near, and in the horizon are seen at long intervals the first suggestions of the mountains. As a rule, the train skims evermore the surface of the earth; there is neither cut nor fill. The sky is a blue canopy overhead, and the earth is an infinite pasture of coarse grass, broken with patches of sand.

We now pass the tributaries of Red river and the Brazos. If our vision could stretch 150 miles to the north we should see the head-waters of the Canadian. Yonder, far to the south, are the gathering streams of the Colorado. Still farther before us, and at right angles to our course, is the Rio Pecos. Within these wide boundaries I estimate an area of 35,000 square miles. It is the Llano Estacado. As we journey westward the vast plateau lies mostly on our right. Verily it is the Staked Plain—staked by nature with multiplied millions of yucca stems, weird and still on the vast expanse. Hence its name. They are veritable stakes of the desert. Sparsely scattered on the borders, they thicken in the distance and blend in a dark, low wall along the far horizon.

But let us note with ever-increasing admiration the glory and splendor of this luminous air. There is certainly nothing like it in the world—except, of course, in California. The effect of this atmospheric transparency can not be appreciated or understood save by experience of the senses. When the vision first reaches out through the shining air you say, "Well!" Your seat-mate says, "Hello!" The lady who sits in the next seat lifts her small kid glove toward the window and smiles. The effect out yonder is nearly like that of a first-class opera-glass, say one of Le Maire's, of Paris. The difference is that when you look through an opera-glass you know you are looking through something, and that there is the illusion of the lenses. But here there is no illusion at all: you just see. The gain in visual distance is just about what you would gain from a good opera-glass. Of course, they tell you all sorts of li— hyperboles about how far it is to this and to that

which you see out there toward the horizon. It is as easy to say forty miles as ten. Nevertheless, you do see with amazing distinctness to an amazing distance. Beyond, on our right, for instance, at this little station on the plateau, is old Sierra Blanca. If the train would stop for a half or three-quarters of an hour (and you consult with the conductor about that matter), you could walk over to the foot of Blanca and touch him. You could look up his shining front and say, "Hello! old fellow, how long have you been here?" But the train is going to pull out in five minutes, and so you do not go. Presently the question is, "How far is it to Blanca, anyhow?" Some guess a mile and a-half; some, distrusting their senses, say three miles, or four miles. You ask the natives on the platform, and they tell you the thing that is not. But the honest and straightforward Capt. W. J. Maltby, of Baird, who knows about these things, says it is *fourteen miles.* Still, to al seeming, Blanca stands just out there. You could go in half an hour and salute his great toe. Farewell, Blanca, perhaps forever!

After Fort Worth, the next formal stage (what the old Greeks called a *stathmos*) for the excursionists was El Paso, Texas. Look at its place on the map. For a good reason, those discerning old Spaniards called it *The Pass.* Here is the Rio Grande; and yonder, to the north, only a few miles away, is the bold and gigantic heel of the Rocky Mountains. Through here you must *pass* if you would go to the sundown. The railroads have found it so. They also must traverse this notch 'twixt river and mountain if they would find their way to the west. So I believe the city of El Paso is wisely planted. It appeared to me to be a good place for establishing an enterprising population of some hundreds of thousands of people. I did not inquire into the census, but I suppose that ten or fifteen thousand have already gathered here; and there is the hum of business. Here we stopped for half a day. Very courteous attentions were given to the Society by the authorities of the city. We were escorted to the hotels, and shown the principal objects of interest as soon as practicable. Many of the company made for the bridge of the Rio Grande, and most of them were for the first time on the soil of a foreign people. This is Mexico; that is the Rio Grande, a broad, flat stream, skimming along over sand-bars, with low banks, or no banks at all; and beyond, and just before, is the low Mexican town of Paso del Norte. A strange sight to the thrifty, blustering American is this quaint, half-silent, sunshiny place, with its adobe houses and musical echoes of the Spanish tongue in its streets. I have been surprised to note how soon the general tone and rhythm of a foreign language will fix themselves in the ear of a stranger. One needs only hear the natives of a foreign city speak their own language for a single hour, and the sound thereof will remain with him forever, like a voice in the tree-tops.

Not a little amusing was it to see the manner in which the good Mexicans of Paso del Norte had planned to entertain us. We were horticulturists, you know—men and women of the garden and orchard. What, forsooth, should the del Norte people do for us to please and instruct our company?

This is what they did. They provided for us a bull-fight. The arena was on one side of their principal street, at the western end – and their old cathedral, built, as they allege, in 1640, was on the other side! These two facts were what they had to show us—an old cathedral and a bull-fight; strange mixture and jux aposition of what remains to us in these last days of the ancient cruelty and persistent faith of the old Latin race.

Some of the more reputable of our company stayed away from the bull-fight; but the rest of us, reckless of reputation, went. The ticket was a dollar. It was strictly a horticultural show! An arena, boarded up to the height of ten feet and about eighty feet in diameter, was the scene. The seats of the spectators rise in rows from the top of the arena, so that the latter appears as a pit. Over the seats, on high, are stretched thin awnings, through which the Mexican sunshine in many places manages to get its yellow feet on the benches. Here is the crowd; and the band of Paso del Norte blows brass music across the arena. The cat-call is "Tor-r-ro! tor-r-ro!" Soon a gate inside the pit is opened, and tor-r-ro plunges in with a snort. He is of a size, shape and general architecture wholly repugnant to the great American idea of what a bull ought to be. Moreover, he has been trained to this sort of business. The scars of fifty old fights are on his neck and shoulders and sides. He inspects the arena, knowing what is to come. Here are the picadores, on foot—gorgeous creatures in green and red, with flat caps on their heads and a tassel. But they are active as cats. In the left hand each picadore takes a red streamer, and a little pike in his right hand. He flings out the streamer in the face of tor-r-ro, who plunges at it. The picadore jumps aside and prods his four-footed superior in the side or neck. There is much of this sort of business. The picadore takes two arrows embossed with colored paper and little streamers. He runs squarely into the face of tor-r-ro, who plunges at him, and when between the very horns of his enemy reaches over and plants his javelins in the taurine shoulders. There they stick. At the last the matadores come in on horse-back, either with lassos to throw the bull and relieve him of the tormenting spikes and arrows in his flesh, or else to kill him with a saber-thrust in the side and drag him out of the arena. During the afternoon there were four of these fights. The sympathy of one of the spectators was wholly with the bull, and doubtless many others entertained the same sentiment with regard to the essential merits of the contest. Is a white man ever justifiable in going to a bull-fight? Rarely, if ever. There is one pretty thing to be seen in Paso del Norte, and that is the Spanish baby sitting in the window on the south side of the principal street, seven doors east of the crossing of the Mexican Central Railway.

Over in El Paso the excursionists suppered after the manner of American citizens, and then betook themselves to the trains. It was already the gathering shadow of evening, and we must now tunnel through another night. It was matter of regret to most of our company that the darkness fell upon us on our entrance into New Mexico. Nor did we make our exit

into light until we had entered Arizona. We know where we are going, however, as well as if it were day. We know that on leaving El Paso we are to cross the Rio Grande and traverse from end to end the celebrated Gadsden Purchase. It is the old Mesilla valley, south of the River Gila, embracing an area of 45,535 square miles. This is the country which was "*purchased*" from Mexico by the United States in 1853. The transaction was a sort of amicable *finale* to the treaty of Guadalupe Hidaldgo; that is, our mild-mannered Uncle Samuel took a few millions in his left hand and a rusty sword in his right, walked up to Republica Mexicana and said: "A fair day to you, my sister. I've bought another of your little farms. There's the money; take it, or—"

With the morning of the 16th of January, our vision took in, for the first time, the landscape of what the last generation chose to call the Great American Desert. The atmosphere above this Arizonian plain shines like crystal. The plain is almost absolutely treeless and void. Except some cotton-woods on the margins of far distant and ambiguous streams, nothing worthy of the name of tree is seen. Still we continue to traverse that limitless expanse of coarse, but nutritive, grass on which the millions of buffalo once inhabiting this infinitude fed and fattened and flourished. Buffalo grass is the alfalfa of the bison, as the clover is the alfalfa of the Jersey heifer.

It were hard to conjecture the outcome of this strange and marvelous Arizona. What is it to become in the future? Can large populations plant themselves, expand with enterprise and quicken under the stimulus of great resources here on this seeming waste? Can cities be built, and trees be planted, and mines be opened and hamlets scattered through this vast region, with its arid surface and flashing atmosphere? I know not. Doubtless the accessible supply of water lies at the solution of the problem. This American desert, be it known, is not the desert of Cobi, not Sahara. These latter are merely infinite plains of juiceless, lifeless sand, heaped here and there in dunes and tossed by reckless whirlwinds. Not so these plains of Arizona. They have in them, on the contrary, every condition and element of boundless fertility and fruitfulness, except—except *water*. It is water, fellow citizens, that you must have. If we could, we would rain upon you; but we can not. Our humidity is hardly enough for ourselves. Therefore, we can not be wrung out for your sakes. You must either drip or dig. If you will, mayhap you shall flourish; but without some artificial contrivance for watering your desert, it appears to us that it is destined to lie there blistering in the sun, flashing briefly with its spring-time expanse of buffalo grass, and then drying up like a furnace for ages yet to come. May you be watered, O my brethren!

From the entrance into Arizona the ascent is gradual, but generally perceptible, as you journey to the middle and western parts of the territory. Our excursion made one important stop in the region here described. At Tucson, about midway of the Arizonian plateau, our sections drew up for dinner. The hotel piazza skirts the railway tracks. It is called the San

Xavier, and is in every respect a reputable place for eating. Under the porch, when we were pilgrims there, were set up the bones of an enormous saurian, taken from a sand-bed not far away. They were, indeed, gigantic fragments, and were, evidently, constituents of a frame that would have been appalling in its entirety. From some hasty proportions I figured his length at 180 feet. You could have put a six-inch stove-pipe through the foramen in his cervical vertebra. As to the rest, we were not a little interested with the horticultural display which the wide-awake people of Tucson and vicinity had extemporized for us on the platform. Benches were set, and the products displayed after the manner of a fair. Several ladies were present, who were, evidently, in sympathy with their country and believed in its resources. Especially did the affable and polite Doctor ——— expatiate to us on the excellence of what Central Arizona was able to produce and exhibit. As a matter of fact, the vegetables shown were by no means of an inferior quality. Some pumpkins sat there serenely, as big and yellow as those of the Ohio valley. There was also some corn, well developed, but rather small and flinty. There were squashes and beets, both of superior quality, and Lima beans not to be excelled. Some other beans, manufactured after the Spanish pattern, were exhibited on the benches, and several succulent plants completed the fair—and a good article of celery must be added to the list.

What else may be said of the Arizonian landscape? Over the buffalo grass is seen ever and anon a vast area of sage-bush and cactus. Of the former much has been said and written. It is a peculiar evergreen sort of a growth, as high as your breast or head, and having somewhat the general shape of an arbor vitæ. It is not bright green in color, but dirty looking and melancholy. The bushes are scattered irregularly at an interval of a rod or five rods in the thinner thickets; but in the denser parts they crowd up against each other like the evergreens of a nursery. In such places you see no longer the plain, but the level top of the sage growth stretching for miles away. This scraggy bush seems to subserve two general purposes in the economy of nature. First, it furnishes the Arizonian cow with a *dernier ressort* in the way of browsing. For a great part of the year, indeed, it is her principal resource and comfort. The man accustomed to the sweets of civilization enters some objection to this kind of forage for the reason that it taints those curious substances alleged to be milk and butter. It should be observed, however, that even this flavor of sage is not as bad as that infamous weed called the ramp, which the cow of the Ohio valley used to get to the utter disgust of all who lived upon her bounty. Clumps of cattle are not infrequent on the Arizonian plains. They are more plentiful here than in Southern California. A week or two later than the time here referred to I saw these Arizonian bullocks, rather blue as to their meat, hung up in a denuded state in the market-house of Los Angeles, a spectacle to gods and men. It should be said, in this connection, that the cattle all the way along

from Eastern Texas to the spurs of the Sierra Madre are rapidly losing their wild and ferocious aspect, and, under the impact of foreign breeds, are taking on the civilized countenance and æsthetic architecture of the Durham and the Holstein. The Texan steer, famous for years in the cattle traditions of mankind, with his six-foot spreading horns and speed of a racehorse, has already become a specter, and in another decade he will have gone to join his friend, the buffalo, in the limbo near the moon.

The second general use of the sage-bush is to furnish a necessary covert and castle for his excellency the Marquis of Leap. Vulgar people call this nobleman Jack Rabbit, a low and undignified name, totally out of keeping with the character of him to whom it is applied. The Marquis of Leap lives in the sage-bush. It is his keep. His manner of life is that of a feudal lord. He goes forth on expeditions, and then returns to his own place. The Leaps constitute the largest family known in the blue-books of nobility. The fact is that, unless the laws of primogeniture and the doctrine of entails shall be adopted by them, it appears that the whole family and tribe will degenerate into a gross democracy. Still, from the passing trains of civilization, the danger seems not imminent. A single marquis or duke is seen, at intervals, sitting unarmed near his residence or careering away on some romantic expedition. As he rides, he rises in the saddle.

Concerning the other vegetable growths of Arizona, the most conspicuous are the cacti. Of these, the name is legion. Without attempting to discuss varieties, I will mention only a single species, and that the most conspicuous. The giant cactus (*Cereus giganteus*) is, I believe, one of the most interesting objects of natural growth to be seen in the world. It is certainly one of the most peculiar. From a poetical point of view, it has the quality of adding to the solitude of the desert. Its aspect almost makes you afraid. Under the moonlight it becomes a veritable ghost. The plant consists of a single column, rising with perfect perpendicularity from the ground to the height of ten, twenty, even forty or fifty feet. It is a fluted column of pale green, covered all over with small, white clusters of nettles and quills porcupine-like and barbed. It stands in perfect stillness. A group of them in the shadows of evening are as weird in appearance as the standing rocks in the Garden of the Gods.

Besides the sage-bush and the cactus, many other varieties of such like half-desert growth are found as you continue your journey. When the train stops to water, you skurry out for ten or twenty rods and pluck off or pluck up a half-dozen kinds of semi-evergreens. You guess at their names. You ask your learned friends in the Pullman what they are, and your learned friends do not know. You lay them up in the hat-rack till the next stop, when the same observations are repeated. The next day all your specimens are gone. Nobody brought anything home with him, except the indefatigable Vice-President Munson, who is still considering the subject.

Our course now lay through the western parts of the territory, where we were still more astonished with the brilliancy of the views, the absence

of vegetation, the infinite expanse and the far-off mingling of earth and sky. It is in this region that the Arizonian towns and hamlets of the mud-builders are so frequently discovered. I do not mean archæological ruins, but living towns, full of Mexicans and people. You see them at a distance of a mile or two, these low adobe buildings set in a row, as if fronting on a street—perhaps it is a street. The houses are as cubical as a die block, and about as high. They have square doorways, and in these the traveler is likely to see several walnut-hued, Indian-like faces, half-covered around with long streams of the blackest hair. In fact, the hair of these people, especially the women, is so black that it is white. But I was speaking of the houses. They are, to all intents and purposes, an exact reduplification of the structures that covered the ancient Babylonian plain a thousand years before Nebuchadnezzar was a boy. The only difference, as I understand it, between the houses on the banks of the lower Euphrates and the Tigris, as they were built and inhabited almost 4,000 years ago, and these adobe huts of the mixed races populating Western Arizona is that the rule of building among the old Babylonians required that all structures should be set with their corners, rather than their sides, to the cardinal points of the compass. All the modern people, so far as I know, choose to set their buildings so that the sun, at rising, at noon, and at evening, shall strike the three sides rather than the angles of the structure. Canst thou tell me why, O man that knowest?

CHAPTER II.

FROM YUMA TO LOS ANGELES.

The Colorado Desert.—Committee from Eschol.—Fruit Banquet en route.—Ontario and Pomona.—Orange Orchards Galore.—First Glimpse at The Angels.—Down to Santa Ana.—Glance by Daylight.—Excursion through the Valley.—Therefore, Resolved.—The return to Los Angeles.—Sketches of the City.—Good-night.

The Southern Pacific Railway as it reaches from the plateau of Arizona for the southeast corner of California descends with some rapidity to a lower region of country. On this part of our route we again ran into the darkness. Our trains entered the Golden State at Fort Yuma about midnight. At this point the railway bends northward to reach an approximate parallel with the Pacific coast. During the remainder of the night we ran through what is called the Colorado desert—a long, low trough between the Sierra Madre and the Coast Range mountains; and with the coming of dawn we found ourselves in a region of lifeless aspect which might well merit the designation of desert. The route from Yuma to a short distance north of Indio is nearly all below the level of the sea. At one place the track descends to a depth of 300 feet below that level. From this great sag the train creeps up, through a course of some 120 miles, to the little town of Indio; and here, for the

first time, the traveler from the south strikes the real California. In early morning our excursionists were breakfasted at Indio; and here there had been prepared for us a rare and most agreeable surprise, first of many which the enusing month had in store for the members of the Society.

The enterprising citizens of Riverside, some sixty miles further on and to the left of our course, had prepared for our company its first feast of fruits, and had sent the same by a committee to meet us at Indio. Here, on our arrival, we found a commodious room at the station stored with beautiful baskets laden with the choicest fruit, one basket for each member of the Society. Each of these packages contained such a store of samples and varieties as would be hard to parallel anywhere in the world. First of all, there were in the basket three or four of those tremendous and luscious Washington Navel oranges, as big as cocoa-nuts, entirely seedless, and rich with meat and flavor. Next, a half-dozen little mandarins, with their kid-glove finish and pungent juice, were added. Then came two or three splendid bunches of that great grape called the Muscat, famous everywhere in California as the best of the raisin-producing varities. To these were added clusters of the raisins themselves, made from bunches of the same grape. Finally, there were in the interstices some excellent specimens of figs, prunes, apricots, English walnuts and almonds, the whole covered with flowers.

All these choice fruits were grown at Riverside, in that splendid citrus region which we were afterward to visit. It is not impossible that the people who sent us, in advance, these three hundred baskets of fruits and the committee who delivered them into our hands, and who rode with us on our way as far as Colton, had some justifiable pride in their contribution to our knowledge and happiness. I say happiness, my friends; for you should have been partakers of that lunch of Paradise. The appetite of a man who has traversed a thousand miles of plateau and desert is fearfully and wonderfully made. The travelers took each his basket to his respective Pullman, and there he did devour it as to its contents till nothing thereof remained. Some thought to preserve a residue for the future; but, like human wrath, which is said to disappear with sundown, that fruit melted away. The Riverside committee, with the companionable Mr. H. J. Rudisill as its chairman, made the acquaintance of our company, and left us for their own place at the town of Colton.

This part of the journey was still through a region which was only a modified form of the desert behind us. At Colton you pass between the two flourishing towns of Riverside, on the left, and San Bernardino, on the right, both almost in sight of the train. Immediately after leaving this place the scene begins to change. The landscape shows evidences of reviving vegetable life. At the town of Ontario these traces of revival are distinct, and promising young orchards appear of oranges and apricots. To most of the excursionists, this was their first glimpse of that great fact in the prophecy of California, the orchard of orange trees. The sight, especially in midwinter, is beautiful, inspiring. The orange is a tree of

dark-green foliage, and the contrast in color between its leaf and its fruit is restful to the eye, pleasing to the taste. But of this much more hereafter. At the little town of Pomona, with her mythological name and pleasant gardens, the evidences of fruitfulness were still more abundant. The orchards grow almost continuously on either hand. They stretch away to still greater distances. They flash up green and luxuriant again and again as the delighted excursionists sweep on through their first surprises at the spectacle of green leaves and ripening fruits in the middle month of winter.

We were now in the valley of San Gabriel, and were nearing the metropolis of Southern California. The railway here bends to the westward, as though it would plunge down to the Pacific. In the mid-afternoon of this 18th of January, as we whirl on through what is now an almost continuous grove of orange trees, alternating with orchards of apricots, peaches and prunes, instinct touches our elbow and says, "City!" It is a great distance back to the last one! But yonder are the spires of another; not many spires, but many roofs, and even the beginning of noise on the streets. Here, then, we are at the station of La Ciudad de la Reina de Los Angeles, the *City of the Queen of Angels*, or, for short, Los Angeles. Our stay in the western metropolis, however, is to be but brief this afternoon, for we have been invited by the officials of the Southern Pacific Railway to accept the courtesy of a free excursion down to the town of Santa Ana, and the citizens of that place have added their invitation. It is thirty-eight miles distant, a little to the east of south. And here we go.

It gives one a shudder, however, to be transferred from the luxurious cushions of the Pullman to these bare and rattling day-coaches; and, by the way, what are these black-looking spots on the floor between the seats? But the ride is a joyous one. You have to sit close together; ladies or no ladies, it is all the same. There is none of the stately distance and cold disdain of the sleeping-coach, where everybody has a square yard to himself; so we are happy on the way. And here is the town of Anaheim; and three or four miles further on is the pretty Santa Ana herself. We can not see the lady, however, to-night; she has retired. The excursionists are quartered on the town, and many of them in the Hotel Brunswick. With the morning light they peep out of their windows, and, lo! a vision is there—yards, not green, indeed, but full of flowers, roses blooming, calla lilies standing with their big cups open to the sunshine, and orange trees on every hand. Under those trees what do you see? It is the scattered golden fruit. January and February are the months of the ripening of the orange. Recently there has been a wind, a high wind, a dreadful wind, in all California. Much fruit is shaken down, but much more hangs on the bough. The orange stem, by the way, is, fortunately, the toughest stem in nature; you may pull and pull to no purpose. It even resists your knife-blade as though it were of whalebone. Nevertheless, this ill-omened wind twisted off much fruit, and there it lies. Never the like of that did you see before, my friends. Those oranges lying there under the trees on every hand are as thickly strewn and as little

noticed as the black walnuts where they fall in autumn under their parent trees in the Wabash valley. When you first gaze upon this fruit-covered ground you hear a voice much like that which came to St. Peter when he saw the sheet full of things, saying, "Arise, slay and eat."

After breakfast we observed this scene with wonder. Up and down the street on either hand, everywhere, you have this semi-tropical display. Here, too, are palm trees and an occasional banana. Here are long lines of the beautiful, smooth and white-barked English walnut, shaped like an apple tree, but handsomer. I do not mean like a California apple tree, but like an old orthodox Puritan Pippin or Vandeveer. Now we are taken up by this train of free carriages and driven about the young city and its environs. It is what the Californians call a valley. Inside the compass of the foot-hills we have here an area of about 20,000 acres, all adapted to the raising of oranges and other fruits of the semi-tropics. Figs grow here, lemons, apricots, prunes, English walnuts, almonds, and even the banana a little. The people of Southern California claim the banana, and even the date palm; but these are truly tropical fruits, and I doubt whether they will flourish as far up as this region. But there is enough here, and to spare. Without going beyond the range of home products you can make up a table to set before a king. We are driven through beautiful avenues, with orange orchards everywhere, vineyards there and apricots yonder. These Santa Ana people claim that they can do the business without artificial irrigation. Doubtless they can; indeed, it is manifest on every hand; but perhaps a controllable supply of water would add somewhat to the regularity of their production and the excellence of their products.

There is, on this 19th of January, a sale of lots and properties going on in the city. Part of the motive in bringing us here was that we might be present at these auctions. Some of us attended the sales; others concerned themselves simply with the productive resources of the region. All were delighted with this first of many journeys aside into the blooming and fruitful towns of California. We were treated in a hospitable way by the citizens of Santa Ana, and, before departing for Los Angeles, had the pleasure of telling them what we thought of it in the following words of hearty formality:

The people of Santa Ana have just reason to be proud of what nature has provided for them, and what they have so diligently improved. We tender them not more our thanks than our congratulations.

It is our deliberate opinion that they have planted themselves in an environment as favorable for profitable industry as it is inspiring to the highest faculties of taste and beauty. Their wide and mountain-girded valley seems to us to be almost an ideal home for man, and the promise for the immediate future is that it will become a veritable garden to its utmost limit.

To the people of Santa Ana we are indebted for a view of the most novel and beautiful landscape that most of us have ever seen, and we take this imperfect method of expressing to them our sense of satisfaction and gratitude.

The return to Los Angeles on the afternoon of the 19th gave us opportunity to see the country by daylight There was much variety of scenery. Here and there a hamlet or small town, little valleys with considerable elevations in the distance, recurring orange orchards and farmers' ranches. On arriving at the city we availed ourselves of the remaining day to visit its places of principal interest, and to drive through some of the beautiful suburbs. This was our first contact with the real city life on the Pacific coast. The aspect of everything is sufficiently different from what we should meet in the Middle or Eastern States. It was our misfortune to reach Los Angeles at a time when excessive rains had reduced everything to a loblolly. The streets fairly sloshed with their currents of mud. The sidewalks, however, are good; and little does the Queen of the Angels care for such a trifle as mud. Of all the cities built by men, none has had a better opinion of herself than this Los Angeles; and not often, I believe, has the opinion been founded on better reasons. Perhaps the city has already reached a population of 65,000. Her census is increasing at the rate of about 1,200 a month. She believes in herself and in her future. She goes with a rush. Here on this principal street the throng is as great as on Fourth street in Cincinnati. A regular funeral procession of hurrying citizens is on either side; and as for business, the roar is like that of an incipient Babylon. She has her extravagances, too. She has staked out all the circumjacent country and named her streets and numbered her lots for miles away. She has put up the price of these properties until the mention of the figures on a corner lot would strike a millionaire with hiccough.

The people talk of cutting California in twain about the midriff, making a southern State withal. Of this, Los Angeles is to be the capital and glory. She is going to do for herself, moreover, what nature has failed to do, that is, scoop out a harbor down yonder on the Pacific, twelve miles away. No matter what it costs, she will have a harbor. She will make one as good as that of San Diego; and then, like ancient Athens, she will have a kind of Piræus and a Boulevard des Nations leading up to the metropolis. The fact is that what Los Angeles has not dreamed of doing, and imagined herself capable of doing, is inconceivable. The average visitor, as he scrutinizes all this business, at first makes up his mind that all these booming schemes will, one of these days, split like a balloon, and that the fellows careening in the basket below will find the earth by a sudden and accelerated descent. Darius Green decided that flying was easy and delightful, but that the critical point was when you came to alight. It is due to say, however, as it respects this Queen of the Angels, that she has $15,000,000 on deposit in her banks, and that she considers her present swell no more than a premonitory symptom of the bigness of her destiny. The resources of this beautiful valley of San Gabriel may, perhaps, justify her confidence and fulfill her dreams.

As we were not going to leave the city until midnight, many of the excursionists spent the evening as they would in seeing the sights. As the

hours passed and the necessity came for getting to our coaches, we found the rain pouring down, and as the station was at considerable distance, it became a serious matter how we should reach it. Part of the excursionists got dolefully lost in the rayless streets of Chinatown; and some otherwise dignified gentlemen came to the train that night in such plight of mind and person as they were never in before. Under such circumstances the warm and genial apartments of a Pullman car at midnight are among the most grateful refuges that a mad and muddy wayfarer ever sought or found. For the present, Oh, Queen of the Angels, *au revoir.*

CHAPTER III.

THE SAN JOAQUIN VALLEY.

The Mojave Desert.—A California Valley.—The Sierras and Coast Range.—Tehachapi.—Feat of Engineering.—The San Joaquin and the Sacramento.—The Society Makes an Impression.—The Tulare Reception.—Sketches of and about the City.—Products.—Temperature.—Fruit-Drying, Natural and Artificial.—Invited to Fresno.—The Reception There.—Carriage Views of the Environs.—Barton Vineyard.—The Vineyard Typical.—Off for San Francisco.—View of the City.

It was almost day-dawn on the morning of the 20th of January when our pilgrims left Los Angeles behind them and struck out through the valley of San Fernando for the mountains. The reader must here examine the map and note the course of the Southern Pacific Railway from the south to Central California. He will observe that some thirty-five miles from Los Angeles the railway strikes the mountain range, through which it makes its passage down the northern slopes into the Mojave desert. The contrasts in the forms and features of the landscape in this region are sufficiently striking and memorable. In emerging from the cañon to the plain you find yourself in a veritable desert. But here, as everywhere, the reader must be on his guard with respect to the meaning of this word. Desert in California means simply a waterless plain. You must not think of sterility in this connection except as superinduced by the lack of water. As like as not you are whirling along over a soil of infinite fertility and fifty feet in depth. So it is, doubtless, in this Antelope valley, through which we pass after leaving the mountains, and so, also, in the desert of the Mojave itself. But as the case now stands this waste, much like some parts of Arizona, seems incapable of any production whatever. I have little doubt, however, that just in proportion as the water supplies of yonder mountains are tapped and led down in life-giving streams to this barren plain, the borders thereof at first, and all parts afterward, will burst out blooming with all those things which the senses of men desire and their appetites consume.

Here is the town of Mojave. In a subsequent part of his own journeyings through California the writer was lodged at this place for eighteen hours. During that time he did as much as his natural parts would bear in traversing the desert stretches and in climbing the mountain-slopes six miles away. The latter experience gave him opportunity to study in its first conditions the wonderful process by which these valleys have been formed. The Californian valley is totally different from the fact so called in the countries east of the Mississippi. The former is simply a level plain between the mountain ranges. This plain is sometimes a half mile and some times a *hundred* miles in width; but whatever be its extent, the process of formation has been the same. The substance of the valley is the *detritus* of the mountain-slope. Yonder, on the right and left, at an average distance of from five to thirty miles, rise the sloping walls of the Coast Range and the Sierra Nevada. They are made, for the most part, of granite. Here and there they are of porphyry or sandstone. The latter is Hugh Miller's famous old rock, and the former, along with gneiss, is, I believe, a member of the granite group. Now, this granite, exposed to the action of the elements, gradually decays. In vulgar language, it rots. It breaks off in small blocks, perhaps an eighth of an inch, may be half an inch, in bigness. These, in their turn, disintegrate under the action of the elements. The needles of sunshine and of frost penetrate them till they are reduced first to sand and then to soil. Meanwhile, the rains come. Heaps of snow are piled up in the gorges. With the return of spring these melt and rush down in turbid floods, carrying with them the material with which the valley is filled up. Of course, a lowland formed in this way will be nearly on a water-level. As a general rule, the California valleys are as plane as the surface of the sea. In this respect, their appearance, until broken by vegetation and the works of man, is less varied than that of the smoothest prairies of Illinois or Iowa.

Our Society was borne on through this Mojave desert—and now the map is again in requisition. The reader will note that the Sierra Nevada and the Coast Range mountains bend together at the northern extremity of the Majave desert, thus constituting what is virtually a continuous chain. The two ranges are like the link of a log-chain laid on the ground. At the apex of these mountains which you now approach is the great pass of Tehachapi. Through this famous mountain gorge we now make our way, climbing up to a height of more than 4,000 feet, and then winding around the summits on our way down by the little Swiss-like town of Caliente into the great San Joaquin valley. It is at this place that Mr. Hood, the distinguished engineer of the Southern Pacific Railway, in order to gain distance in the descent from Tehachapi down to the plain, has performed the difficult feat of constructing a loop. That is, the track of the railway is carried around a series of declivities until it *passes under itself* nearly at right angles. On the descent you see before you, and far below, the tunnel under the track through which you are to pass in winding down. At the same time the track is visible be-

hind you on the mountain-side, and far above. To one unaccustomed to such wild and magnificent scenery, and such astonishing windings about of the rushing train, the scene before and behind, above and below, on the right and on the left, leaves on the mind an impression of sublimity and of the triumph of human genius over the tremendous obstacles of the natural world which can never be removed by circumstance or dimmed by the lapse of years.

We now find ourselves at the bottom, or cul-de-sac, of the great valley of San Joaquin. Again, O reader, consult the map. This splendid valley stretches, as you will see, from this bottom against the mountains to the latitude of San Francisco. There it is joined from the north, as you will further observe, by the equally magnificent valley of the Sacramento. These two plains are the glory of California. They are formed as follows: The San Joaquin river, taking its rise in the mountain ranges of Mariposa, flows down into the plain, and thence makes its way to the north through a distance of more than a hundred miles. In like manner the Sacramento, gathering his waters from the great ranges about Mt. Shasta and Mt. Cloud, and, indeed, from all the mountain spurs as high as the latitude of Goose lake under parallel 42° N., descends to the level, and flows with full volume to the south until, at a point due east of San Francisco, the two rivers join their waters and fall into Suisun bay. Thus it is that one great valley, fully four hundred miles in length and in some places nearly a hundred miles in breadth, sweeps from north to south and from south to north through the center of the Golden State.

This region is the foundation, the basal fact, of those tremendous productive resources which, as much as her gold, aye, more than her gold, has justified California in calling herself the Eldorado of the world. This is the region where, aforetime, the older men of the California of to-day became the kings of the flocks and herds. It was on this magnificent plain, especially in the northern part of it, that twenty years ago the traveler might see the expanse clouded, here and there and everywhere, with thousands and hundreds of thousands of cattle and sheep. Such ranges as were established in this limitless valley were never seen otherwhere in the world, except in New South Wales and Queensland, and there only for sheep. Even to-day, as you sit by your window journeying from Caliente to Fresno and from Fresno to Lathrop, you see, ever and anon, the shades and ghosts of the magnificent herds which once flourished on this beautiful plain.

By the time our excursionists were well on their way to San Francisco we became aware that we had had the good fortune to attract the favorable attention of the people of the Golden State. Everywhere we were met with marks of favor and esteem. Doubtless, to a certain extent, the Californians were, for interested reasons, desirous that we should be well impressed with their country and themselves; but the members of the American Horticultural Society are the last of mankind to remember or consider this part of the subject. We recall only the hospitality with which we were treated

by the citizens of the great commonwealth where we were strangers. They made friends with us. They took us to their homes. They showed us their cities and country. They spoke with pride and exuberant spirits of what they had and what they expected to have hereafter. There was nothing small or meager about any part of the treatment which they bestowed upon us. They invited us here and there and everywhere, and welcomed us as guests and kinsfolk.

On our way through the valley of San Joaquin we were met, first of all, by a delegation from the town of Tulare. We were asked to stop and banquet with that people and to ride with them through their vineyards, orchards and fields of alfalfa. We soon learned, in such cases, to extemporize little official and semi-official meetings on our train. We then and there resolved that we would do this or would not do that. In the case of the invitation from Tulare, we gladly accepted the call. Our train reached the station about sunset, and we were received by the citizens with the greatest cordiality. They had prepared for us a banquet at their principal dining-hall, where we found the tables loaded, as usual, with substantials and fruits and flowers. Nearly everything had been gathered from the gardens and orchards and fields about Tulare. After the banquet a formal reception was tendered to the Society in the Odd-fellows' Hall. We were welcomed in good speeches, and replied as best we could. Resolutions were tendered to the authorities, and guests and hosts fraternized after the manner of our kind.

Tulare is one of the newer towns of the San Joaquin plain. It is not a large place, but flourishing and full of pluck. Here, as almost everywhere, the great question is water; how to procure it and how to distribute it are the problems. Artesian wells are successful in the neighborhood, and mountain reservoirs and Tulare lake and river are expected to do the rest. It is a great region for alfalfa. We were assured by the gentlemen who welcomed us at the reception that as much as eleven tons to the acre had been produced in the vicinity. Apricots and French prunes grow well in this part of the valley. The summers are hot here, the thermometer rising with facility to 108° and 110° in the shade. This, however, is no uncommon report in the matter of California temperatures; but all Californians do solemnly affirm that in their dry, light atmosphere a summer heat of 110° does not oppress the human system, and is by no means so dangerous to health and life as is a temperature of 90° in the lowlands and heavy, humid air east of the Mississippi.

The chief resource of Tulare is, I believe, in her production of the raisin grape. The whole region is well adapted for vineyards. The grape crops are profuse and rich in sugar, and the weather, in the drying season, is so hot and dry as to cure a crop with the greatest facility and perfection. It may be remarked in passing that this is about the latitude where the traveler from the south touches the wine-producing districts of California. In general, the south is favorable to the raisin grape

and the north to the wine grape. Perhaps I mistake in giving the first place to the raisin grape in the Tulare district. The apricot orchards are among the finest. Here we become acquainted with the process of drying this fruit, and other fruits as well, by the action merely of sun and air. Be it known that in this California atmosphere vegetable and animal tissues alike are exempt from decay. Fruits and living bodies of all sorts simply dry up into untainted mummies of themselves. No artificial means of preservation are required; and the best of it is that the essential essences, flesh and flavors of the fruits are preserved within the unbroken skins which held them when they were gathered in summer. It thus happens that a California Muscat grape has a raisin for its next form. So, also, of the apricot and the prune, fresh and dried.

We were now introduced to the processes of thus preserving the California fruits by mere natural agencies, and also in the great drying-house of Mr Morton, of Tulare. It is the simplest thing in the world. The fruits are gathered, in their season, into shallow wooden trays about three feet square and three inches deep. When the trays are filled they are set on the ground in the open sunshine between the rows of the grape-vines, of apricot or prune trees, and in a few days the work is done. In the case of the apricots the fruit is cut in halves and the seeds are taken out. The eastern man will immediately imagine the hazards of dews and rains; but the Californian smiles with confidence. He knows that the rain-storm is not going to visit him at this time of the year. He knows that the mere water-juices of his fruits will be carried off by this dry, hot air and contributed to the lakes and snow-banks of the Sierras. His fruits mainly dry into a beautiful wax like substance, semi-transparent as it respects the apricot and raisin, and delicious in the highest degree. As for your cured prune, he remains, as he was before, a veritable Ethiopian.

Before leaving Tulare a message had reached us from Fresno inviting us to stop at that place and enjoy an entertainment. This invitation was also accepted. In the forenoon of the 21st we arrived at this thriving young city, and made our headquarters at the Hotel Hughes. Almost the only drawback upon our enjoyment on several of these reception occasions was the fact that we were there in the season of rain-fall. The California valleys are capable, like other parts of our poor planet, of becoming muddy on slight provocation. This is especially true in places where the soil is much worked up, as in roads and streets. The boulevards of Fresno were canals of mud when we were there, and there was much slopping around; but the people had out their carriages and cabs, and the under-foot condition was as nothing to us.

One thing should be added in this connection, and that is that a California mud-bath is of short duration. Just give the clear air and sunshine a few hours of executive freedom, and away goes your mud. I noticed one thing peculiar about the thin slop of these broad streets in Fresno, and that was that the shining wheels of the vehicles rolling through it were almost as little defiled by its contamination as though they had been driven through

shallow lakes of quicksilver. It does not stick at all. The spokes and felloes and hubs come out absolutely clean. At our hotel we enjoyed an excellent lunch, and were then taken up for our drive through the suburbs and country. It was at Fresno that we struck the grape-producing region in its full glory. One of the finest, but by no means the largest, vineyards in California is that called the Barton, just north of the city. Yonder it is, before you. It is as four-square as Babylon, exactly a mile on each side, and along each side is a shining row of Lombardy poplars. They make an inclosure of just a section of land. It is almost a water-level as to its surface, and one of the darkest and richest soils to be seen anywhere. This land sold, seven years ago, for $20 an acre, but the vineyard was recently purchased by an English syndicate for an even $1,000,000. In the middle of each side of the square is a great gate-way, arched over, with the name Barton on the arch. Two splendid boulevards leading from gate to gate in either direction thus cross each other in the middle of the section. At the crossing, and in one corner thereof, forty acres are appropriated to the buildings and small orchards connected with the vineyard. The remaining six hundred acres are all in grape-vines. Near the northeast corner a canal enters the vineyard, bearing its various channels of water throughout the whole. In this connection it may be said that the distance to which water will percolate the soil from the trench in which it flows depends largely upon the character of the soil. Under favorable conditions the moisture will extend two hundred to four hundred feet without further distribution than the natural percolation of the water. If, however, the soil have any considerable percentage of clay in it, the distribution is by no means so free; and in such cases the channels have to be multiplied.

But now as to the vineyard itself. I did not see a solitary trellised grape-vine while I was in California. No frame-work is employed in its support, except a stake when the vine is young. The idea with the vineyardists of these regions is to produce a grape tree, and not a branching vine; they trim and prune accordingly. All the vineyards are of a common type, as it respects the form and general character of the growth. The vine, on its planting, grows rapidly, and is at once cut back to a low stump. The idea is that the tree shall be from two to three feet in height—hardly more. From this, as the low stump increases in size, vigorous vines are thrown out each year to the distance of from six to ten feet. But these vines, in the following January after they have borne their fruit for the season, are cut away, carried out of the vineyard, heaped in piles and burned. Then you see only the rows of low stumps or stools remaining. These are set about nine feet apart; and the appearance of the vineyard to him who is not familiar with it is sufficiently novel. Such is this Barton vineyard, and such are all the rest. The California grape tree grows in rows. It becomes four inches, six inches, ten inches, in diameter. In such a case it is like the low, tapering stump of a tree. At the Centennial Exposition of 1876 a section was exhibited, sawn from a California grape tree, eighteen

inches in diameter. In the vicinity of the old mission of San Diego there are vines 120 years old, and too large for the circumference of the arms. The average California vineyard of to-day shows a tree of from two to five inches in diameter. There are thousands of acres of young plantings, and occasionally an old vineyard that has seen its day. In some places the rows of trees are as close as six feet together; but, as I remember, Prof. George Husmann, of Napa, told me that nine feet is the proper distance. Here, in the middle of the Barton vineyard, stands the great winery. Fresno is on the border line between the raisin grape and the wine-producing varieties; but the Barton makes wine. Last year the product of the establishment was 385,000 gallons. Here it is, stored in these enormous casks. You pass between them. If their contents should happen to gush out, you would be in a worse condition than was the Duke of Clarence on the day of his suicide.

We are driven through other enormous vineyards in the neighborhood, through apricot orchards, through orchards of prune trees and peach trees, with some English walnuts, almonds and figs.

Fresno is quite a city. There is enterprise here. The fact is that, along this line of the Southern Pacific, there is still a vast opportunity for the investment of money; but, thou simple soul of man who readest it, I have not a cent invested in the neighborhood, and never expect to have! But if I had the money, you know!

At ten o'clock on the night of the 21st we were away for San Francisco, and the next morning we saw spread out on our right a sheet of living water. Welcome, O lake or bay, or whatever you are! At any rate, you are shiny and wet, and I hope you have fishes in you more numerous and happy than these thousands of skimming water-fowl on your surface. The world without water would be a *dry place!* Our commandant, of whom I will tell you by and by, says that it is Suisun Bay. We are heading straight for Oakland. Yonder, on the other side of the water, is the town of Benicia, where the boy John Heenan developed his biceps and pectoralis major before the days of Duke O'Sullivan and the Prince of Wales.

By the map you will see the peculiar configuration of land and water in the vicinity of San Francisco. Suisun bay, you will note, is furthest inland. It is connected with San Pablo bay by Martinez strait; and the San Pablo opens out into the still greater bay of San Francisco. The latter swings inland and drops to the south twenty-five miles or more, dividing the peninsula of San Francisco from the mainland on the east. It is like a great aquatic leaf, having the Golden Gate for its stem. These shining waters are among the most capacious and splendid of their kind in the world. Nature has been very unequal in her distribution of harbors around the shores of this mundane sphere. For some reason the eastern coasts of continents are generally much more favored than the western. The latter are generally smooth and bayless for leagues on leagues away. So it is along the western coast of the United States. The harbors are few and far between.

California has but two worthy of consideration. These are the great bays of San Francisco and San Diego. It is hard to conceive of any more beautiful and safe waters for them that go down to the sea in ships. That of San Francisco is many times the larger; but the San Diego haven is so smooth and deep and sunny, and even capacious, as to invite all wayfarers of the deep to anchorage in its waters.

Here, then, is Oakland; but for the present we concern not ourselves with her, pressing on to the metropolis. Your train strikes the waters of the bay. You run out on the stone causeway and pier till you reach the wharf, with its depot and station of the great ferry-boats. As you pass up into the waiting-rooms and make your exit for the boat you may casually behold some of the most stunning advertisements which the genius of man has yet devised. San Francisco would have you, at the very threshold, to understand that she has her enterprises and her valuables. You walk around to the prow of the Oakland deck, and the bay stretches before you. To the left it reaches to the horizon; to the right you see, in the harbor, Goat Island and Alcatraz; across yonder, there she is:

> "She looks a sea-Cybele fresh from ocean,
> Rising with her tiara of proud towers
> At airy distance with majestic motion,
> A ruler of the waters and their powers."

CHAPTER IV.

IN THE SANTA CLARA.

At San Francisco.—Reception by the Board of Trade.—Glimpse of Santa Clara Valley.—Spanish Names.—Hispanio-Mexican Element in Society.—At San José.—The Citrus Fair.—Fruits and Other Products.—California Jealousies.—A Work of Art.—Sketches of San José.—Banquet to the Society.—The Local Excursion.—Views of the Santa Clara Orchards.—Suburban Civilities.—Prospective Tours.—Down to Monterey.—Typical California Orchard.—A Criticism.—The Live Oaks.—Trees for the Highway.—Monterey Bay.—Hotel del Monte.—Historical Places.—Cypress Point.—The Cypresses.—Sublimity of the Coast.—Sealdom.—Shells.—To Santa Cruz.—Sketches of Shore and City.—The Return.—Redwoods En Route.—Lick Observatory.—Oakland Reception.—The Banquet and Excursion.—The University.—Professor Hilgard's Work.—Metropolis Again.—The Palace.

The passage across the Bay of San Francisco requires half an hour. Landing on the other side, you are stunned with the vociferations and clamor of the cabmen and hotel-runners; but, with all their noise, they stand in rows, and do not take you by violence. Outside you enter the commodious

cars of the first street cable road ever laid on this planet. It required San Francisco to do that thing. We are whirled up to our hotel and rendezvous. It is the *Palace*, my friends, and of the Palace something more by and by Our journey from Kansas City, with the delays occasioned by the blizzard and our several stops and excursions *ad interim*, has occupied eleven days; and we are already hard run for time to reach San José in season for the opening of the session of the Society on the day after to-morrow. Our present stay in San Francisco, therefore, must be merely a pause on the way; but before we go our reception must not be neglected. The California Board of Trade had provided for our coming. They had arranged all things for our comfort and progress. Several of the officials of the board and other distinguished men of the city and State were present to meet us and to greet us. The board has its own rooms and halls of exhibit in the first story of that part of the Palace formerly called the Grand. Here we were received in a body, and announcement was made for some local sight-seeing on the morrow.

The softest bed in the world is that of a tired traveler. You sink upon it with an infinite sigh. Your ideas lose their form and swim into indistinctness. Meanwhile, your body spreads out flatter and flatter on the bed till, in the language of my friend, James Whitcomb Riley, you "drip over the edges just like molasses." For ten days past we had done our sleeping in the Pullmans—a pretty good job, too, in its way, but, after all, dry-land sleeping is the best. It has more body and stability. A man asleep in his close berth in a palace car will dream a long time before he sees the angels or hears a voice out of paradise.

On Monday morning the San Franciscan committee had us out bright and early, or, rather, dark and early—for there was a bad rain, mixed with fog and other ingredients—to see the city. The cable car lines of San Francisco are among the best to be found anywhere. They carry you out yonder to Golden Gate Park, and are there in a twinkling. It is said that when John Wit Tee Man first saw the cable car he walked up to it, touched it, examined it, and then said: "Melican man makee funnee sing, allee samee. No horsee, no mulee; no pushee, no pulleę; go like h—ee, allee samee."

This morning we have our first glimpse of the great park which San Francisco has created between herself and the Pacific. We look out from the famous Cliff House to the Seal Rocks in the offing, inhale the sea breeze, walk a few minutes in Sutro's Garden, which may be said to have more fresh air to the square inch than any other place in the world, and then return to the city and the rooms of the Board of Trade. The Californians are great eaters, but they never drink—hardly ever. A really sumptuous lunch has been spread for us, and many distinguished personages are convened to welcome us to the repast. Hon. M. M. Estee, of Napa, is present, and makes us a speech. So, also, President Hatch and Professor Hilgard, and several other gentlemen from different parts of the State. The good things are taken with free hands, and Johnson, the prohibitionist, of Indiana, is discovered to be

in a hopeless minority. The San Francisco men have fixed up a fine programme for us to be followed out on our return from the south, and many incidental plans are made for our future comfort and delight. These things are announced to us, and then we spend an hour in the halls of the board inspecting some of the finest fruits and vegetables which this poor planet has ever yet produced.

So, tarrying a single day at San Francisco, the Society hurried on its way to the place of its first formal meeting. In going to San José we passed down the peninsula, beyond the bottom of the bay, and made our exit into the valley of Santa Clara. The county of Santa Clara considers herself the favored region of the Golden State. There are many grounds for such a sentiment and belief. As we skim along the perfectly flat surface of the country, almost on a level with the Pacific, we can but be astonished at the evidences of fertility on every hand. Such a soil is, according to my judgment, hard to parallel anywhere in the world. It is a black, damp loam in the lower parts, with an element of sand and drier constituents at the higher levels. Sometimes pebbles and small stones are scattered over the surface, and, indeed, constitute a part of the body of the soil. The color of this earth is not that blue-black hue which sometimes deceives as to its real fertility, but it is the dead black peculiar to the richest loam or humus. It is evident, too, by the first glance, that this promise of fertility in the Santa Clara valley is fully verified by the facts. It is fifty miles from San Francisco to San José. We make the run on the afternoon of the 23d of January. In going down the peninsula, we see on the right the foundations of what is to be the great Leland Stanford, Jr., University. I have made a careful study of the charter of this institution, and say, deliberately, that I regard it as the best organic form that has ever been devised for a university of learning.

Here we are at the old town of Santa Clara. Everything in California is either San or Santa. It is evident that in the prehistoric ages the saints and saintesses were in the ascendant on this coast. The old Spanish padres had the finest and best assorted lot of saints that were ever catalogued. They did them honor, too, when they distributed their names on these mountains and valleys and rivers of California; but whether it is an honor to a saint to put his name to an old adobe mission house, or even to a town, is, at least, questionable. Some of these saintly names are musical, and grateful to the tongue and ear; but others, say San Buenaventura, for a specimen, are tedious and drawling forms of speech that ought to be abbreviated or abolished in the general interests of civilization. As for Santa Clara and San José, their names are exquisite. It is three or four miles from the former to the latter city. Toward evening we are at our destination. Great preparations have been made for our reception and entertainment. Delegations are in waiting at the station to receive us and conduct us to our places in the city. Most of the members are taken to private homes. Beautiful places they are, too, and rich in comfort. Others are lodged in hotels—the St. James, the Lick, and others. The coming of night finds everybody comfortably

ensconced. Here, again, however, as the horticultural pilgrims find to their grief, the mud of the streets is quite intolerable. It has arisen and overflowed the crossings, and the word loblolly is again in requisition to describe it. San José apologized roundly for this condition of affairs. It was her rainy season, she said; and not once in years were the skirts of her garments so bedraggled and soiled. She was sorry. If she could have foreseen it she would have had a force at work to clean the crossings. All this, however, passed in a day or two, and the streets became first passable and then dry and neat.

Here, then, is the first terminus of our pilgrimage to the Pacific coast. San José is a beautiful city. Here about us are a few traces of the old Spanish civilization which was planted in these lovely valleys before the coming of the man who speaks English; but these remnants and traces of the ancient regime are rapidly passing away. That project of Louis Napoleon to restore, as he said, the equilibrium of the Latin races in the new world has ended in thin smoke. The Spanish element in all the western slope of the United States is subsiding. Like the adobe walls of the old mission houses which the padres aforetime reared, with infinite labor, in this region, this southern stock is crumbling down, and will soon be mingled with the soil. It may interest the reader to know what he would easily infer to be true, namely, that the Hispanio-Mexican population in California is most thickly distributed nearest the southern limits of the State. As you journey to the northward the distribution, especially away from the coast, grows thinner and thinner, even to nothing. In the vicinity of San Diego from 25 to 30 per cent. of the population is still of Mexican blood. As far up as Los Angeles nearly 20 per cent. of the people are of this stock; but with the latitude of San Francisco it falls off to less than one-half of this proportion. Meanwhile, however, the Oriental has rushed into the place of the Spaniard—that is, the Mexican Spaniard. It was a bad swap in most respects, but in other points of view I am not sure that civilization has been injured by the exchange. Whatever may be said of the Chinaman in other respects, he is at least industrious and frugal.

On the morning of the 24th the first session of the American Horticultural Society for 1888 was opened in the auditorium of the Baptist tabernacle. Everything had been arranged for the comfort and convenience of our meetings. It had been one of the misfortunes of our excursion to California that the distinguished President of the Society, Mr. Parker Earle, of Cobden, Ill., had not been with us on the journey. He had, however, in due time, arrived at San José on an excursion of his own, and was in his place at the opening of the session.

It is not the business of this general sketch of what we saw and heard and imagined while on the Pacific coast to enter into the details of the horticultural meetings held at San José and Riverside. These details, of course, constitute the subject-matter of the interesting volume to which the present sketch is only an addendum, or afterpiece. This is what the old playwrights used to call an epilogue—a piece to be spoken afterward, or omitted alto-

gether without injuring the sense. The report of the proceedings of our meetings is full of interest. Scarcely a single paper or speech was delivered at these meetings that was not in some sense spoken by one who was an authority on the topic presented. The very best horticulturists of the United States, and, indeed, of the whole continent, were present to participate in the discussions and to add, from the rich stores of their experience and learning, to the value of whatever was said or suggested.

A word, however, should be added in this connection relative to the great citrus fair which had been provided in the city as one of the leading inducements to the Society for holding its sessions at this place. Citrus fair means an exposition, first of all, of the six species of fruits constituting the genus *aurantiacea*. These are, first of all, the orange; second in importance of the group, the lemon; then the lime; then the citron and the shaddock; lastly, the pumalo, or so-called grape-fruit. Each of these has its respective value, but the first three are the important species. These are produced in great abundance and perfection in many parts of Southern and Central California. The fine hall where the fair was held was filled to its capacity with one of the richest imaginable displays of the fruits here named, and of other species better known to the people east of the mountains. It was evident on entering the hall that the genius of woman was dominant in the arrangement of the fruits and flowers. Not satisfied with merely heaping these around or setting the floral contributions in miscellaneous disorder, the ladies of San José had arranged everything after the manner of art. On some tables the oranges were heaped up after the style of cannon balls in an arsenal yard. Sometimes they were so arranged as to make a cottage or grotto. Sometimes they were made into festoons, or intertwined with evergreen. So of the display of lemons and limes, and so, likewise, of all the other myriad fruits which the splendid fertility of the soil and the equable climate had ripened for the occasion.

The citrus fair was primarily the exhibit of the fruit and vegetable products of the Santa Clara valley. Other regions, however, had sent in their contributions. This is especially true of Northern California and Oregon. That part of the display which had been sent to the exposition from the counties of Sutter and Butte was among the most attractive of the various exhibits.

The fecundity of the soil of this country about San José is as well illustrated in the character of its vegetable products as in its fruits and flowers. It is doubtful whether the specimens of vegetable growth displayed in this horticultural hall could be surpassed for magnitude and perfection of development in any garden or field of the world. It is not my purpose to enter into details, but a reference to one single species of vegetable may suffice. Take the beet. Have you an idea, O reader, of the size and appearance of one of the beets of Santa Clara? Here they stand, with the bottom roots resting on the floor, against the side of this pyramid of garden products. It

reaches to the top of your cane. I should have said *he* reaches, for this huge Titan is certainly entitled to the distinction of sex. There, next the floor, are his two short legs, and at the upper parts of his body his arms branch out somewhat after the style of the arms of an East Indian deity. He looks, for all the world, like an image of Buddha. You might properly set him on a bracket and pour a libation to his divinity. His body is more than a foot in diameter, and he weighs a hundred and seventeen pounds. How is that for a beet? Many other products are of almost equally astonishing proportions and quality.

The feature of the display which most astonishes the observer is its variety. Here is almost everything: oranges, lemons, limes, apples, apricots, olives, peaches, prunes, plums, citrons, cherries, figs, walnuts, almonds, pecans, the whole range of vegetable products, products of the field, corn, wheat, barley, oats—why, man, everything that grows in the ground or on top of it, and some things belonging to the deep sea, are here at this exposition; and the Californians are actually aware that they have made a fine display! They smile when they tell you so, and when you tell them so they smile.

I have now reached a delicate point in this essay. I mean the jealousy of the California towns. No girl was ever as jealous of her first lover as one of these communities is jealous on account of its good parts, and the danger that they may be disparaged by comparison. Really, my dear people of the California cities, it seems to us that this thing is misplaced and absurd. Why should your civic communities here and there have envy and enmity toward each other? I can not conceive that any legitimate, right-minded competition should engender such a feeling. On the whole, the exhibition of these jealousies and bickerings is prejudicial to you in the eyes of strangers. Really, you are too great, and have too many of the good things of this world, to indulge in local spites. This envious disposition I have noted reaches to a great distance. One town is jealous of another a hundred miles, aye, four hundred miles, away. You act and sometimes speak and write as though your town and city were the very loadstone toward which all the magnetic atoms of enterprise in the world must be attracted; and when any atom, anywhere, persists in standing crosswise to the lines of your attraction, you get mad and spit.

It is all nonsense, my friends. I can not perceive any legitimate causes for enmity between San José and Riverside, Napa and Santa Rosa, Los Angeles and San Diego. Of course, in so far as there is mere jocular emulation between your different districts and towns it is all right, even amusing. There is no malice in fun. There is no incendiarism in a joke; no bloodshed in a sarcasm. Your jokes at each other's expense are highly entertaining. This great work of art, for instance, which the genius of San José has put up in the principal show window of her principal street, to illustrate the products and manner of life at Los Angeles, appeared to me to be rather harmless—altogether harmless if inspired and understood

as a piece of fun at the expense of the southern city. I hear that a year ago Los Angeles began this business by the construction of a painting of the satirical order, the *motif* of which was a sarcasm on the resources and civilization of the Santa Clara valley. It must be confessed that the San Joséans have got even with the Queen of the Angels. This alleged painting is highly entertaining. It has mountains in the background, sharp and peaked, and covered with snow. They are marked on the summits, "Summer resorts of Los Angeles." Up there in the inaccessible glaciers are laid out lots—"For sale—a thousand dollars per front foot." Down here in the valley are some of the products of Los Angeles—a tarantula, a horned toad, two or three little blasted oranges, some pieces of prickly-pear and bits of broken stone. The artist has had his revenge on the people of the south, sure enough; but I trust he had no malice. Malice is the meanest reptile in the world. It has a head on each end, bites without provocation, eats its own offspring, and hates the daylight.

There are many things about the city of San José to hold the delighted attention of the visitor. It is a beautiful place, and a beautiful country. In ancient days there was an old Spanish mission here, but that has been swept away by the incoming tides of civilization. Progress, refinement, enterprise, wealth, all the benefits born of industry, and all the virtues born of intelligence, have taken the place of ancient immobility and superstition. San José is well and substantially built. The streets are wide and straight. Her public structures are highly creditable. Her people are keenly awake to the benefits of their situation, and are reaping a golden harvest by the development of the limitless resources which nature has put at their disposal. The people of the country round about are adding orchard on orchard for miles away, to the foot-hills of the mountain ranges. In these orchards are planted such a variety of fruits as it would indeed be difficult to parallel in any other region; and the annual yield from these beautiful, bright trees is so great as to be incredible.

Besides the sessions of the Society, besides the valuable addresses which were delivered, besides the rich and variable display of fruits and flowers in the hall of the citrus fair, besides the beautiful city herself, with her endless hedges of square-trimmed cypress, her lines of eucalyptus and her nodding palms, besides our formal reception on the night of our first day, with the music, and speeches, and promenade—besides all this, two or three matters of the first interest remain to be mentioned in connection with our sojourn in San José. First of these was the banquet. On the last evening of the sessions of the Society, in the fine Turnverein Hall of the city, a feast had been prepared for us, and to this, in due time, we were conducted. Many invited guests besides ourselves thronged to the hall. Rarely has such good management been seen, as it respects a great crowd at a banquet. Fully five hundred guests were present. On entering the vestibule, ladies to the right, gentlemen to the left; well ordered cloak-rooms; everything conducted by the compass and square. It was most admirable in the beginning, and the rest

was splendid. On being ushered into the hall, the banquet tables, row after row, stood before us. Here it was that the ladies of San José did themselves proud, indeed. The guests were admitted to the banquet hall section by section. All were seated at the signal. The perfume of rich flowers was in the air. The tables were crowned with blossoms. Great lilies rose to their queenly height. Vases were heaped with fruits. All manner of viands were distributed on every hand. Ladies, whose refined manners were as conspicuous as their executive skill was manifest in the feast, had charge of the various sections, and smiled a welcome to the guests. It has been the good fortune of the writer to be present at several banquets in his life, but it is his deliberate judgment that in the richness of the feast, and the delightful ease with which it was administered, the banquet given by the ladies of San José to the members of our Society on that genial evening of the 26th of January was the richest and most varied that he ever beheld. By this it is not meant to disparage the score of other feasts to which we were invited in the cities of California. Each of these had its particular excellence, as, for instance, our delightful banquet under the dome of the Capitol at Sacramento, which surpassed in elegance and the exquisite taste displayed in its administration. To each of these I hope to give its meed of praise, but I say still that for richness and abundance and variety, as well as for its orderly programme and added circumstances, our feast at San José is entitled to first praise.

Post prandia sermones. In the American vernacular eating and speaking are correlatives. *While* he is eating your citizen speaks not, but afterward—then it is he breaks forth into utterance. At this San José banquet Mayor Breyfogle, to whom so much of the success of the whole enterprise was due, presided with the grace of a diplomate. After his introductory remarks President Parker Earle responded for the American Horticultural Society, speaking with that dignity and grace for which his name had already become a proverb. Prof. George Husmann, of Napa, followed with an address on California, and then Judge M. N. Myrick spoke of "Our Visitors," praising us more than we deserved. The toast, "Our Overland Journey," was answered by Secretary William H. Ragan, who sketched the story of our progress by rail across the continent. "The Santa Clara Valley" furnished the theme of an address by Prof. Charles H. Allen, and then the alleged poet of the company was called up to read the following verses:

HORTICULTURE—THEORETICAL AND PRACTICAL.

To study much a fact called chemistry,
  To learn earths, acids, alkalis and all,
To know all seeds, and name all bugs you see—
  Is Horticulture Theoretical.

To reason much about the cause of things,
  To make analyses and classify
All buds and bodies, leaves, legs, scales and wings,
  And give them titles that may pass for high;

To talk for weeks how much of this and that
  Is necessary that a plant may grow;
What rain-fall, dew-fall, sun, wind, cloud are pat,
  And then tell others what you do not know;

To raise within a busy cranium
  At least six crops before you plant at all;
To write long letters, and for papers some,
  Is Horticulture Theoretical.

To feel the sunshine and the morning dew;
  To smell the ground in the first days of spring;
To have for company yourself and you;
  To hear the robins and the bluebirds sing;

To hoe and harrow, and to put plain dirt
  On living seeds, and then to wait awhile;
To be afield in democratic shirt,
  And use your muscles in plebeian style;

To take all nature in your hardened hands,
  Train trees, train vines, plant, prune, protect and pluck,
Believe in self, and in your fertile lands,
  And have more faith in living than in luck;

And then at last to sit in welcome style,
  With golden fruits heaped up in royal state,
Offered by beauty, with a gracious smile,
  To strangers dwelling in the city gate;

To taste, to eat, to feel the throb of pride,
  To rise rejoicing from the festival;
To clasp new friends with old ones by your side,
  This, this is Horticulture Practical.

Hon. M. M. Estee followed with an address on the glorious climate of California, in the course of which he spread wide his arms—in metaphor—to embrace the coming millions. E. J. Hickson spoke for "The Press of the Golden State;" and Mr. T. S. Hubbard, of New York, of "The Successful Past." Vice-President T. V. Munson was regarded by us as the prophet of the Society, and he was accordingly assigned the toast, "What of the Future?" to which he responded with his proverbial ability. The delicate part of the evening's exercises, under the title of "The Ladies," was assigned to the dignified J. M. Smith, of Wisconsin, who handled his angelic subject with the courtesy of a knight. The last speech of the evening, and the most witty of all, was made by the good-humored and perfectly correct Nicholas Ohmer, of Dayton, Ohio, who responded to the toast, "When shall we meet again?" That question, permit me to say, is difficult to solve. Alas! when *shall* we meet again? Certainly, not this side of the shadows. That crossing of mul-

tifarious lines of life down at San José on the evening of January 26, 1888, formed a plexus of human hopes and interests and affections which will never be woven again this side of the mist-covered valley which Mirza beheld in his vision. Meanwhile, Tuck's orchestra, after much sweet music, gives us the blessed refrain of "Home, Sweet Home," and the banquet is at an end.

The next theme of interest connected with our stay in the Santa Clara valley was our excursion into the country round about on Friday, the 27th. Promptly in the morning we were taken up by a retinue of carriages and driven countryward. The calvacade broke up into sections. Each turned hither and yon through the valley as it would. This whole country might be defined for short as the Orchard of Santa Clara. Taken altogether it is an orchard. On either hand, orchard after orchard, vineyard after vineyard—apricots, prunes, lemons, peaches, figs, English walnuts, limes, almost everything called by the name of fruit. Here it is, for miles on miles; and the trees are bright, even to whiteness. Rows of English walnuts shine as though they had been polished by hand. The fig trees are almost as white as they. Along the roads are the deep-green pepper trees, and the tall eucalyptus. In the yards and lawns rise the feathery palms, and around all the homes of men is the square hedge of well-trimmed cypress.

One company makes its way out to the Quito Ranch, where Mr. E. E. Goodrich has developed one of the finest olive orchards in California, and the proprietor made all happy who visited his fine establishment. The writer can not testify as to all that was seen in these valley excursions about San José. He knows that a second division of the Society was driven to Los Gatos. That, O reader, means "The Cats." It is the name of the narrow gauge railway station and the adjacent hamlet. The tradition is that the old Spaniards called it Los Gatos because of the fearful prevalence of wild cats aforetime in this region. Well, "The Cats" had made a banquet for their company of excursionists, and the eaters thereof declared that the feast was good. The section to which the writer belonged was driven to Campbell's Station, among some of the best apricot and prune orchards in California. He had the pleasure of going with Major Foote, a Hoosier of former days, through his orchards, and of hearing from the Major the almost apocryphal recital of how much his trees produced. The citizens, meanwhile, had made for us a dinner in the village church. Here we had feasting and talk and speeches. The table at which the writer regaled himself was absolutely laden with its vases of fruits and nuts and other edibles, under a crown of flowers. I could not now enumerate the endless variety of what our feast presented, but my old friend, the Captain, who presided at our table, and who has been more than sixty times across the Pacific, assured me that only *one article* on the board was not produced within a mile of where we sat. This was a single small dish of foreign oranges. The Captain's wife, I may add, served her guests, before we rose, with a section of excellent fruit-cake, fresh and good, which had been twice across the Pacific ocean, and had spent one sum-

mer with the Captain in Siberia. Farewell, ye good people of San José and the valley of Santa Clara. May you all live long and still have something to eat. May your city flourish and your orchards still abound, and your boom boom on forever!

Before the close of our session at San José our spirits rose to enthusiasm with the announcement that after our return to San Francisco we were to be favored with an excursion into Northern California. The Southern Pacific railway arose, by its representative, Mr. J. B. Lauck (of whom I have several things to say anon), and announced the programme of our journey into the Napa and Sacramento valleys as far north as the city of Redding. Be it known that this munificent offer on the part of the railway included everything in the way of expense through a journey of several hundred miles. Of course, the company did not propose to furnish us provisions, but we had now learned that the California towns along the way were an ever-recurring picnic, each vieing with the other in its abundance. The proposition was, of course, accepted with enthusiasm; but in the mean time still another excursion had been provided for us down the coast to Monterey, and this latter came first.

Accordingly, on the morning of Saturday we bade adieu to San José, and took our course for that old town where the hoisting of the stars and stripes first announced the domination of a new power over the effete civilization of the Spaniards. The distance down the valley, and with a sudden turn to the coast, is ninety miles. Through this region the same scenery and aspect prevail as in the upper parts of the valley. While we roll along on our way I will offer a comment or two about the general features of the orchards of the California valleys. I have already spoken of the trees, as to their freshness, thrift and beauty of color, but not as to their shape.

The Californians trim everything low. They cut back the growing tree, of whatsoever kind it is, until its whole development is so near the ground as to be almost in reach of the unassisted hand. Travelers from the older States are astonished at the low stature of all the tree-growths on the Pacific slope. Take the apricot or prune tree for example. Yonder they are, by hundreds and thousands, and all alike as to their form. The Californian, with his tremendous nursery shears or clippers, or his big knife with the aquiline beak, in the first place cuts off his tree when it is transplanted, or a year thereafter, at the height of about two feet from the ground. Around this section a cluster of vigorous shoots spring up. Of these from three to five of the best are selected to constitute the major divisions of the tree. They, in their turn, are allowed to grow for one or two years, when they too are cut off about three feet from the lower stump. Each of these branch sections acts like the original stump in sending out laterals, and thus the trees develop in almost perfect symmetry and regularity. It surprises the foreigner in these parts to notice the beauty of this tree development in the orchards of California. As to setting, the distance from row to row is an average of twenty feet. Some orchardists place their trees nearer than

this, and some, perhaps, a little farther apart. In general, the apricot, the prune, the peach, the apple, the pear, the English walnut, the fig, the cherry, and even the orange and the lemon, are set at about the same distance. I think that the rows of the citrus trees, however, are set a little closer on the average than in the case of the other species.

I will offer one criticism on the methods of the California orchardists. Why have they not—why do they not—reject the parallel row system of planting in favor of the hexagon? I was surprised to note in how few instances the hexagonal method has been employed. The planter ought to remember that a sort of general architectural taste is to be observed in the arrangement of his trees; nor should the much more material circumstance be neglected that a given area will contain a very considerable number of trees, when they are set on the hexagon, in excess of what the same ground will bear in parallel rows at equal distances. I believe that the average California orchard would gain a hundred trees in number if the hexagonal method were employed. I do not know whether the cultivation of the spaces between would be hindered in working among the hexagons, but certain it is that there would be a great gain in space and a greater gain in beauty; all of which is respectfully submitted.

Let us turn for a moment, then, from the orchards to the natural landscape. The valley which we are now traversing is better wooded than any we have thus far seen. The live oak is the principal native tree. It were hard to say whether in this famous tree the element of beauty or of value is predominant. It has a novel appearance to one who has not seen it often in the native state. It rises to the height of about seventy-five feet, but the native trunk is not tall and grand like the trunks of our close-set forests in the Mississippi valley. The live oak branches out to a great extent. Its strong arms, somewhat gnarled, reach wide, like those of the eastern elms in old age. But the live oak without its foliage is a more picturesque tree than the elm; with the foliage I think the elm would surpass. In the still uncultivated regions of the Santa Clara valley, and below, the live oaks may be said to abound. You will see to the right or to the left tracts of fifty or perhaps a hundred acres still covered with them, as in the days of the Spaniards. The most striking feature of the tree, as discriminated, say, from the winter elm or black oak of the Middle States, is that it is hung with moss. I am confident that this covering is of a different species from that of the moss which hangs in long festoons from the great live oaks in the southern lagoons and everglades. The latter is longer and coarser, and of a darker color. The former is a light gray, and seems to crown and wrap about the scraggy branches rather than to depend therefrom.

But the most striking thing of all about the live oak woodlands of California, and, indeed, of nearly every kind of sparse forest growth which prevails in this comparatively treeless country, is that the trees have, for some reason, been distributed by nature with almost the regularity and precision of a planted orchard. I was astonished, and, at first, deceived, by this singu-

lar appearance. When the phenomenon first caught my attention I thought that the trees in question had been set equidistant by hand. It is difficult to impress the reader with a notion of the extreme regularity which is displayed in the distribution of the thin, small woods of California. When they were planted nature must have been just fresh from a recitation in geometry. At intervals you will behold, from the car window, as you pass along, an area of perhaps a half mile in extent where the live oaks, rising above the pasture lands, have almost precisely the appearance of an old orchard in which the trees have risen to rather gigantic proportions. In the California landscapes, at least in all of those before you reach the real forests of the mountains, you never see a clump of trees crowded together or scattered at the capricious intervals which characterize such growths in our States of the Mississippi valley.

I have still time, before we reach Monterey, to speak of another general feature of the California method as it relates to trees. The people of these valleys have done admirably in the matter of bordering their highways. Rarely will you find a road in a well settled district without its two rows of trees. These are already well grown, and as you bowl along you are comforted by having on either hand a long line of well developed trunks and branches. For this admirable purpose the Californians have chosen two kinds of trees. These are the pepper tree and the eucalyptus, both evergreen and beautiful in form. The pepper tree is a daisy in its way, having the general features of a willow as to its trunk, and a cypress as to its top. The foliage is fine, and depends from the branches most gracefully. One of the greatest merits of the tree is found in the wax-like or varnish-like finish of the small, bright leaves. It is to this circumstance that it owes its power of shedding the dust. Your dust, of what sort soever, finds a difficult lodgment in this dark-green top. Great clouds of that fine sand and pulverized soil, blown up by the wind and driven against these long rows of pepper trees, go over them and through them, and leave them clean and bright. Very different is the eucalyptus. This is a tall and aspiring tree, tapering as it rises, like the Lombardy poplar. The body has something of the appearance of a sycamore as to its color, though not so white; and the cinnamon-like bark on the lower parts curls up from the trunk or falls away. The eucalyptus is a rapid grower. I believe that it outgrows any other tree with which I am acquainted, unless it should be the Japanese Pawlonia Imperialis. At the age of ten years the eucalyptus is already a fine tree, eighteen inches in diameter, and from sixty to eighty feet high. The planting of these highway-border trees is going on everywhere in the valleys of California. It is an admirable enterprise, and the spirit that begat and promotes it is worthy of all praise.

Before reaching the old town of Monterey you skirt the bay of the same name, leaving it on the right. The town itself stands at the bottom of the haven. It is by no means a large or commodious body of water, and I should think that its wide mouth, open oceanward, would swallow a pretty

large section of a Pacific storm. The waters, moreover, are not deep enough for the best results as it respects ocean vessels. We did not run down at first to the ancient city, but stopped some two miles above, at the station called Del Monte. The reason of the name Del Monte is not far to seek, for yonder, at no great distance, on a beautiful plateau slightly raised above the bay, is the great hotel from which the station has been named. There among the trees crowned with the richest foliage, and approached by exquisite winding drives rising to the acclivity, stands the great Del Monte herself. Suffice it to say that as it respects the beauty of the grounds, the delicious, balmy air, the shrubs and flowers—great roses putting the Marechal Neil to shame, tulips and lilies and blooming plants unnamable—the really tall trees that rise above it all, the lovely walks that wind among the hedges and into the evergreen labyrinth on the margin of the lake beyond, this magnificent hotel by the bay of Monterey is one of the most admirably situated for the comfort and pleasure of its occupants to be found not only in California, but anywhere in the world. The hotel itself is a marvel without and within. Rarely will you find such spacious halls and reception-rooms and parlors, and such elegant chambers, in a building for the public. Everything, moreover, is as quiet in these halls and about the premises as a summer day. True, the dining-room, a magnificent apartment, has a capacity for about five hundred guests at a sitting; but there is no twenty-minute business for dinner about this. Gentlemen and ladies are these who sit down to lunches and dinners fit for a palace of royalty. I have neglected to say that we were brought down to the Del Monte in charge of the accomplished Mr. Judah, one of the managers of this part of the Southern Pacific system. Of course, our friend Mr. J. B. Lauck, in whose charge we had been all the way from El Paso, was still with us, and that by our own request; but Mr. Judah was responsible for our comfort and pleasure on this part of our journey. In taking us to the Del Monte to pass a single day as guests, he conferred a favor which will not be forgotten.

After a brief rest in the delightful grounds, we were taken up in a cavalcade of elegant carriages and driven around the bay. At the lower part of the harbor we passed through that old and quaint city to which the Spaniards gave, aforetime, the name of King's Mountain, or Monterey. Here we saw very many remembrances of the people and times by whom and in which the city was planted. Many of the buildings are adobe. There is nothing grand about the place, but it has its memories and traditions not a few. Here where we pause on the corner are the old headquarters of that gallant American squad of adventurers and heroes who wrested California from the Spaniards. Here stands that memorable old flag-staff from which Sloat and Stockton and the still greater Pathfinder of the Rockies first floated the stars and stripes in token of the new era of independence and political freedom in the west. Yonder, on the summit, in plain view, are the ruins of the fortification on whose walls the brave little cannon of this heroic band were planted in that day.

Whirling on, and ascending the peninsula, we pass into and through the great camp-meeting establishment known as Pacific Grove, and then emerge, or rather immerge, into the dark pine woods lying between the grove and the more famous region beyond. After a drive of some miles, with the perpendicular walls of pines on either hand, we come to the edge of that celebrated forest called the Monterey Cypresses. Of these wonderful trees there is here an area of about five hundred acres, through which you pass to Cypress Point on the Pacifie. According to Professor Gray, this is the only place in the world where the Monterey cypress is found in the native state. The trees so called are among the most picturesque and grand of all the growths on our planet. They much resemble the famous cedars of Lebanon; but the Monterey cypress is flat on the top, spreading wide, banyan-like, on its upper surface. One of the most inspiring spectacles I ever beheld was that of these great cypresses growing down to the very rocky margin and precipice of the Pacific and leaning back from the deep as they had been driven and pressed by infinite storms blowing landward through the ages. And yonder before is a wonder still more sublime. It is the Pacific itself, rolling in, in tremendous waves, her thunder and roar resounding among these giant rocks that stand defiant around the bleak promontory, as if to guard it and protect it from the assaults of everlasting warfare. Of all the places along the sublime margin of this majestic sea, I saw none that could quite equal the grandeur and magnificence of the tumbling and booming waves as they broke and rushed and receded from the granite barricade and battlements which nature has planted and reared against the rage of the infinite waters at Cypress Point.

During our stay of an hour at the Point we had the pleasure of seeing and watching the maneuvers of the great marine democracy of the Commonwealth of Sealdom. They had a convention on the afternoon of our arrival, and some of the leading orators were vociferating to a crowd of some five or ten thousand assembled citizens. The meeting was held on some granite rocks half a mile from the shore. The old Norsemen of Iceland used to hold their Allthing, or Congress, in a natural concavity or amphitheater in the mountains, about the center of the island. The place, undoubtedly, was sufficiently solitary and sublime. I am not sure, however, but that this granite areopagus of the seals, with the roaring waters at its base, is a grander place for discussing the affairs of government. Ever and anon, while the orators were still under way, new delegations arrived and climbed up into the crowd. There were old men and women and boys. A few sat silent and weighed the reasonings and declamation of the speakers in a critical and judicious way; but the younger and more aggressive element wriggled about in the throng, and created great disturbance. One commendable feature of the convention was the absence of brass bands!

Cypress Point is one of the best places on the coast for the gathering of shells. Down yonder some hundred feet over these precipitous and almost inaccessible walls of granite, where the surges slosh among the rocks, the

ocean people have their abodes. The finest of all is the abalone, which here grows to great size and perfection. He is a univalve, not a bivalve, as his one-sided house would suggest. He lives on the side of a rock, to which he fastens himself, his position being determined by the level of the surf. On his rocky hinge he turns back his house like the top of a cab; and when the marine creatures which constitute his food drift into his establishment he closes doors and regales himself with something to eat. The shell of the abalone is one of great brilliancy as to its inner surface. It has all the beauty and variegation that laminated pearl can exhibit, and the naturally rough exterior is susceptible of a polish which fairly dazzles by its radiance and beautiful spots. Many of our company availed themselves of the opportunity to gather specimens of this shell; and they are now safe in distant regions, on the center-tables and among the bric-a-brac of our homes east of the mountains.

So much, then, for our stay at Monterey. On the afternoon of the 28th, after the customary conference at the Del Monte, we decided to return to San Francisco by way of Santa Cruz. Thither we now betook ourselves, arriving near nightfall. This city is also, primarily, another of those old settlements which the Spaniards planted on the Pacific coast. It is another Santa; and, to tell the truth, there is more evidence of the original Santa about it than many of the other cities of equal size. We were here on Sunday, the 29th, and did as much as good people could do to inform ourselves of the characteristics of the place and the surrounding region. Santa Cruz has a very picturesque and wonderful coast. It is not high and bold, like Cypress Point. The valley here runs out to the deep on a sort of level, and when you come to the ocean the land is broken off square down to the surf. The body of the projection on which Santa Cruz is built is a kind of a half-stone, variable in its hardness and resistance to the waves. As a consequence, the ocean has eaten into the shore in a curious, even marvelous, manner. In some places the surf has wrought its way under ground to a great distance, and then has made itself manifest by the dropping in of the earth from above. Great and dangerous caverns have thus been produced. Really, one must be careful about his footing as he adventures along these precipitous and treacherous banks. The billows here, as at the Point of Cypresses, break high, with their everlasting monotone, against the rocky barrier that constitutes the *thus far* of their aggressive warfare.

At Santa Cruz we enjoyed the rare luxury of paying our bills. We had a drive on the same terms, and the mud was a serious drawback to our expedition; but the country through which we passed was beautiful and fruitful, after the manner of nearly all the California lowlands. One of the inducements of our coming to this region was that we might return through the redwood forest that interposes in the mountain belt between Santa Cruz and San Joseé. We had been told that by taking this route (a narrow-gauge) we should have ample time and opportunity to see the big trees of the highlands. Our expectation on Monday morning was accordingly high; but we

were doomed to some disappointment. The authorities of the narrow-gauge railway, or some of them at least, had promised us to make a stop at the redwood forest, that we might see the wonders; but, up to the present date, that promise has not been fulfilled. We were driven right through, and had to catch such glimpses as we could of the big trees of the mountains. The better part of the grove was so situated that we could not see it from the train; and of the rest you can, of course, have no more than a glance as the train rushes along, whirling around knobs and diving into tunnels. Of the latter I may say, as a matter of interest, that there are two on this little road from Santa Cruz to San José that are each more than a mile in length It was after debouching into the valley on the other side that we passed *The Cats* already referred to on a preceding page. On coming to San José some straggling and unadventurous members of our company were taken up; and then we whirled on toward Oakland, where another grand banquet and reception had been planned for the Society.

As we passed on our way thither, a short distance north of Santa Clara, a sudden movement of the passengers to the right-hand side of the coaches indicated that something unusual had appeared in the horizon. Indeed, it *was* something unusual. There, at the distance of six or eight miles, were the foot-hills, and, beyond, the more aspiring elevation of the Coast Range of mountains. Above all the heights in this part of the chain, there stood old Mount Hamilton; and on its clearly defined summit, scalped somewhat and flattened for the purpose, was seen the sharp outline of a structure reared by man. It was a building, square and long, and low toward the southern extremity, but rising at the northern end into a dome of perfect regularity and beauty. Everything was sharp and fine and shining in the morning light. Why should I name this famous structure, known already in the annals of mankind? Everywhere on this mundane sphere, where the heavens are seen above by the intelligent eye of man, there the fame and prospective renown of the Lick Observatory have already extended. And the day comes, O my reader, when the huge Patagonians, bounding among the rocks of the Land of Fire; when the black villagers now drinking out of their ivory cups in their huts above the falls of the Congo; when the savages who dash in reckless nakedness out of the forest to plunge into the waters of the Victoria N'yanza; when the swarthy folk who beat down the three-cornered pods from the cocoa trees in the groves of Ceylon, will gather with eager haste into their academies of science to hear the reports of their secretaries concerning the latest revelations of the great equatorial on old Mount Hamilton.

Think of this, my friends. Only a quarter of a century ago it was believed and taught by scientific men that the limits of our knowledge of the heavens had been almost reached—that the peculiarities of the atmospheric envelope of the earth, and the difficulties insuperable in the nature of the material substances out of which telescopic apparatus must be constructed, had established an everlasting barrier against the further

penetration of human thought and perception among the mysteries of the stars. Vain chimera and foolish hypothesis! This side of that quarter of a century line lies the spectroscope, with its astounding revelations. This side of that line lies the great 27-inch objective of the royal observatory of Russia, made by the unrivaled hands of Alvan Clark. Aye, better still, this side of that line lies yon tremendous triumph of the human genius over the conditions of its environment. One of the old Hebrews burst out, saying, "How beautiful upon the mountains are the feet of him that bringeth glad tidings!" O man, how beautiful upon the mountain are the form and substance and prophecy of that glorious instrument up yonder, through whose 36-inch all-seeing eye, with only the eye of man at the aperture below, the sky has opened to infinity, the mighty planets have stooped down, and the eternal stars have become an apocalypse of glory!

It is of interest to note that the magnifying powers of lenses are to each other as the squares of their diameters, which gives us for the great objective on yonder height a capacity as compared with that of the telescope of St. Petersburg a proportion of sixteen to nine, and as regards the almost infinite spheres of space which they respectively penetrate and resolve, a proportion of sixty-four to twenty-seven. So vast has been the advance of science at a single stride.

All this while the Oakland committee are waiting for us at the station. Here we are at one of the handsomest cities on the continent—not a great city as yet, but a real city and beautiful. Oakland is, for short, the Brooklyn of San Francisco. By no means would I disparage the resources and achievements of the city as it respects commerce, manufactories and monetary enterprises. In these respects the Brooklyn analogy is somewhat broken. Oakland is not merely a city of residences. It is a city in other respects; prosperous for the present and promising for the future. On our arrival we were immediately marshaled to the principal restaurant, with its capacious dining-hall, and were there feasted after the style to which we had now conformed by practice. The Oakland banquet was a superb affair, marked with the usual abundance of fruits and flowers; but to this feature of the dinner were added certain touches peculiar to the city banquet as distinguished from the barbacue-like abundance of smaller festivals.

We were welcomed to Oakland in excellent speeches by the Mayor and other distinguished officials, and to these our own officers responded, as they always did, with good taste and eloquence. As soon as the banquet was ended we were taken up for our drive through the city and its environs. This was one of the finest and most instructive minor excursions with which we were favored during our stay in California. The fact is, the writer himself was rather broken up in his emotions and sentiments by his ride through the streets of Oakland and out to the villas of the foot-hills. The residences here are of the highest order. Everything that wealth of resources and exquisite taste can produce has here been amply planted and developed around the elegant homes of the people. The largest private flower garden

which I saw in the Golden State was in the south-eastern suburbs of Oakland. I regret to say that the malicious and unprecedented winter, which the Californians had just been visited withal, had nipped many of the flowers with its frosty teeth and blackened others with its breath. It was a piece of business of which any decent and well-regulated winter would be ashamed for a hundred years.

One feature of our Oakland excursion was the visit to the University of California, situated at the town of Berkeley, about seven miles away. The location is one of the most picturesque imaginable. Some goodly mountains rise from the very skirt of the campus—and apropos of them several of the heights have their traditions and history. The buildings of the university are not especially imposing, but inside there is every evidence of efficient work and rapid development. At the time of our visit to the institution the Regents were wrestling with the question of a new President, the issue being, before our departure from the State, the election of Hon. Noah Davis as Chancellor. The peculiar nature of the resources and products of California has impressed itself upon the university. It has a certain industrial and agricultural aspect and tendency as yet. This feature of the institution, upon which I found no criticism, has been emphasized, I believe, by the great talents and reputation of Professor E. W. Hilgard, by whom this department of the university work is inspired and directed. There is an art gallery here of much promise, and a library already well developed. In fact, I was much impressed with the extent and variety of the works and the skill with which they were arranged for consultation and reference.

Another feature of note is the establishment specially devoted to what may be called the analysis of products. California is rich in what our friend Tacitus would call "the things sown." It is important that these things sown should bring forth something of value for the sower. That this value may be of the highest degree it is requisite that the fruit and grain products of the earth shall be perfect, each in its kind. Now Professor Hilgard has an elaborate establishment for determining the qualities of fruits and other products of the soil. Take, for instance, the question of wine. He and his well educated assistants, whose acquaintance I was glad to make, receive the products of the various wineries of the State and pass upon the quality thereof as it respects their purity and other elements of excellence. This work, I perceived, is doing a vast deal of good in the way of establishing a high standard of merit, not only as it respects the uses and abuses of juices, but also for the perfection and value of all manner of fruits.

With the oncoming of evening the various sections of our party returned to the city, and thence across the bay to the metropolis. Again we found ourselves ensconced at the Palace—rightly so named. Be it said that California is the land of hotels. To a stranger coming into these regions for the first time it seems almost absurd to witness the rising in the midst of some village town, which as yet exists only by hypothesis, of a vast hotel. In the towns of the older States the hotel has an importance directly in proportion

to the square of the distance. The character of the old-time tavern, or public house, is established in tradition and song. Since the time when Chaucer's pilgrims set out from the Tabard, taking mine host with them, on their way to Canterbury, the inns of the English-speaking race have been nothing to seek. With the rise of the great commercial age the city hotel has come; and, with the progress of civilization to the westward, it has become an institution, certainly an integral part and parcel of all cities.

In the great cities of the east, and of the Middle States, the first-class establishments for the entertainment of guests have taken a high rank both for architecture and furnishings and style of service; but it has remained for San Francisco to claim and, as I think, to take the palm of excellence. At least, her Palace Hotel proclaims herself as the first and best, not only in the United States, but in the world. I think it may not be controverted that the Palace is the largest and most commodious establishment of its kind. It occupies, besides the addendum known formerly as the Grand, a whole square of the city, having its principal front on Market street. It is seven stories high, is superior in its architecture and elegant in adornment. It has no fewer than a thousand and fifteen rooms for the accommodation of its occupants. The dining-hall and hall of the restaurant are among the finest apartments of the kind; and the superior methods of caring for the guests and the details of accommodation are worthy of the highest praise. The building is a quadrangle, having a magnificent court in the center. This is entered at one side by the carriages, which find ample room within for the delivery and reception of guests, and for exit. Around the four sides of the court, which is covered with a glass canopy on high, are the interior balconies, or promenades, supported by rows of Corinthian pillars. These afford to all the guests the opportunity of looking down upon the marble floor of the court, where throngs of strangers are passing and repassing, and where, on every evening, one of the finest of bands discourses excellent music. I can not enter into minutiæ, but will sum it up by saying that whoever will seek or find the ideal of entertainment, the luxury of rest, the exclusiveness of absolute privacy in the midst of the most active tides of civilized life, may enter with confidence, as he will certainly remain well pleased, into the great Palace of San Francisco. O thou skeptical cynic, dost thou think that the poor writer of this panegyric had gratuitous benefits at the Palace? Indeed, it is not so. He paid his bills like a gentleman, and had no favors above the rest.

CHAPTER V.

TO THE BASE OF SHASTA.

Northward Bound.—San Pablo Bay.—Napa City.—The Wine Question.—St. Helena.—Banquet and Excursion.—The Boom Business.—En Route to Sacramento.—Hydraulic Miners and Riparians.—Issue of Their War.—Effects of Mining along the Rivers.—Sketches of Sacramento.—The Banquet.—To Marysville.—Reception and Drive.—Notes of the Country.—Oroville.—The Mining Region.—Climatic Peculiarities.—Local Excursion.—At Chico.—General Bidwell.—Excursion Through His Ranch.—The Diggers.—The City.—Greetings of the People.—Vina.—Standford Vineyard and Winery.—Redding Reception and Banquet.—Speeches.—Shasta.—Red Bluff Excursion.—The Country.—Woodland.—The Blowers Ranch.—Transformation of California's Industries.—The Day of Gold.—The Day of Cattle.—The Day of Wheat.—The Day of Oranges.

On the evening of the 30th of January we held in parlor A of the Palace Hotel a somewhat formal meeting, and heard the details of our great excursion beginning on the morrow. We are to go into the Napa and Sacramento valleys. Mr. Lauck announces the programme and names the places which we are to visit. Several distinguished persons have dropped in to the meeting. Bishop Charles H. Fowler, of the Methodist Episcopal Church, is one of the number, and he makes us an interesting and happy speech. Dr. A. F. White, of Santa Rosa, is there, with his committee, inviting us, on our return from the north, to visit the county of Sonoma and the redwood forests lying between Guerneville and Cloverdale. It was decided to accept this invitation for the following Friday. After adjournment our company divided on the line of the tired and the tireless, the latter going out on an exploration of the city and the former to the quiet and rest of their chambers.

On the morning of the last day of January we left, in sunny weather, the metropolis and its shining haven, on our way to the valley of Napa and the Sacramento. The Society was in full force; and many gentlemen and ladies from the Pacific States and beyond the mountains joined our company. No part of our tour was a happier voyage than that which now lay before us. At the first we skirted the San Pablo Bay, and then crossed Martinez Strait by ferry. I shall not forget the sullen humor with which the old English captain of our ferry declared to a company of us, whom he had invited to the upper deck, that he had never but once in his life been six miles from the sea, and if the Lord should forgive him he never would do that again. He was an Englishman by birth, a sailor, first to the Indies, afterward to Australia, and then a Forty-niner in these harbors of Eldorado.

Our first stop on our way northward is at the town of Napa. This is the residence of Hon. M. M. Estee, late Republican candidate for Governor

of California, and also of our friend Professor George Husmann, one of the most eminent grape culturists of the Golden State. We are met, as usual, at the station by committees, with carriages and hacks. In these we are whirled away on our local excursion through the vineyards of Napa valley. It is, indeed, a delightful region. I should think that, as it relates to grape production, this is one of the best in all California; and as to other products, it is scarcely second to any. Our drive through the country was completed with a banquet, given us by the citizens, at which, again, we could but be amazed at the variety of fruits and flowers.

It was evident from the festival that the wine interest is here in its highest estate. The extent and variety of wines displayed and freely poured at the Napa banquet would astonish, and did astonish, the travelers from beyond the mountains. The people of this region make a great point of producing light, pure wines, that is, acid wines, as distinguished from the heavier and sweeter varieties, such as port. They strongly advocate the use of the beverage, and their tables and sideboards are, everywhere, burdened with the product of their wineries. It is due to say that I saw no evidences of intoxication or of the demoralization of character by the use of this world-renowned drink. I may add that the question of the use of this variety of light wine was much and ably debated during the sessions of our Society and by our members and California friends while on our travels. Whether the road to the perfect sobriety of our American people lies by the way of these lighter fermented beverages, or whether we are to reach the desideratum *per saltem*, and, as it were, a single leap upward from the marsh of drunkenness to the salubrious plain of a sober life, I know not; but one thing I do know, that the condition of the people as it respects sobriety in the midst of these vineyards and wineries of California is very greatly superior to that which we see so painfully and shamefully illustrated in the streets of our Middle-State cities and towns. By this I mean that the drinking of the fiery waters of whisky and brandy and gin, the horrible decoctions bearing these Satanic names, is, to my mind, infinitely worse, as it is exemplified in the East, than the home and table consumption of wine, as it is illustrated in the daily life of the Upper Californians.

Taking leave of Napa, we returned to our train and resumed our journey to St. Helena, which was our next place for stopping. On arriving there, in an hour or two from our departure, we were astonished to find another banquet ready spread for our consumption. The consuming power of man, as it respects banquets, is inversely as the square of the number. The department of the interior is not of infinite capacity. The human stomach has its metes and bounds. Doubtless, the greatest increase of its capacity is due to travel and excitement. However this may be, we again feasted at St. Helena, and I doubt whether the good ladies who administered to us of their bounty, and the officials who welcomed us in speeches, were aware, from any manifestations on our part, that only three hours before we had, in like manner, suffered in the cause of civilization.

St. Helena is another of those beautiful valley towns which so abound in the lowland regions of California. These towns are in a state of rapid development and progress. Of this there can be no doubt. Nearly all of them have their boom, and are defiantly declaring, in the face of heaven and earth, that that particular spot is the original Eden and the coming Paradise. Much allowance must, of course, be made for this exaggeration; but after all necessary deductions have been made on the score of the hyperbolical language of the Californians, it must still be allowed that in respect to substantial enterprise and public spirit, and real confidence in the future, these rising cities of California are worthy of the highest praise.

The majority of the towns which our Society visited during its stay on the Pacific coast range from three to ten thousand inhabitants to each. The people of these communities are wide-awake, progressive, and especially industrious. I am free to say that I think a lazy man in California would starve to death in a fortnight—that is, starve or steal. On the other hand, enterprise has a golden reward. There is a vast deal of speculation on every side, and in all kinds of properties. The first form which it takes is the speculation in real estate. All the towns are thronged with real estate brokers. Their voices are on every corner. They are a shrewd class of citizens; but, after all, most of them whom we met were gentlemanly in their manners and straightforward in their discourse.

The same remarks made with respect to the wine interest at Napa may be applied to St. Helena. The vineyard is here the principal thing, and the vines are of the wine-producing variety. It is the one great interest of the people of the Napa valley—not that they are incapable of producing an almost endless variety of other fruits, but the region is specially adapted by nature to the production of the wine grape. The consequence is that as this interest is developed the wineries more and more abound. I doubt whether any census could gather the precise details of the wellnigh infinite production of wine in this valley. The people of St. Helena gave us a magnificent dinner, and our ride through the region round about was one of continued interest. It was at this point that the eminent Secretary of the Society, Hon. William H. Ragan, of Indiana, rejoined our company, after an absence which had covered the whole space of our journey from San José to St. Helena.

During our tour to the north, through the various towns en route, many persons of distinction in this part of California, as well as committees and delegations from the towns ahead, were constantly joining us for a part of our journey. Our departure from St. Helena was in the mid-afternoon, and we now made our way at full speed for the capital of the State. The distance from San Francisco to Sacramento is ninety miles, and the schedule required our presence at the latter city at 5 P. M. After all our local excursions and banqueting, and other unforeseen delays, we reached the capital on time. On going into the commodious station we were greeted by a great throng, drawn thither by curiosity to witness our arrival. A deputation

from the city authorities came to meet us, and in a short time we were distributed through the city, partly at our own will and partly at the will of others.

The companion of the writer, as we walked up to the principal street, said to him, "On an old counter in a little house standing on that corner I one time saw a bushel of gold dust in a single heap." There are some marvelous things not only about the history of Sacramento, but also about its present conditions and surroundings. When the city was built the valley here was at a much lower level than at present. In fact, the first stories of the houses are now underground, so that buildings on principal streets appear to be lower by one story than they are. That is, the floors of the second stories are now on a level with the streets—and thereby hangs a tale.

Know then, O reader, that gold has been produced in this State of California. At the first the method, as you know, was the simple placer mining, which so easily enriched the first adventurers. The accessible free gold, however, became scarce at length, and new methods of procuring it had to be adopted. About twenty years ago hydraulic mining came into vogue. Reservoirs of water were established in the mountains. This was brought down in great conduits, ending in a tremendous nozzle, sometimes as much as nine inches in diameter. Few processes in the practical arts have ever more strikingly illustrated the force and vehemence of natural agents than did the tremendous, irresistible column of water shooting from the nozzle of the hydraulic apparatus. This water, directed against the hill-sides and mountain-sides, knocked everything to right and left, and dashed and poured down the solid earth and tumbling rocks in chaotic torrents into the sluices. The latter were sometimes miles in length. A sluice resembles a mill-race. It is virtually the same. Across the bottom are nailed the cleats, over which the rushing torrent of muddy water pours along in its precipitous descent, but deposits, as it flows, its heavy particles of gold. These lodge against the upper sides of the cleats, and afterward are gathered, a veritable golden harvest.

Now, the debris and detritus of all this business found its way, of course, into the tributaries or main channels of the upper California rivers, and they began to fill up and overflow their banks. The process continued, and the streams spread wider and wider over the bottoms. These low lands were the agricultural lands of the State, rich and valuable. In many places the farmers along the banks of the rivers were at first disturbed, and then ousted from their ranches. The towns and cities were frequently built on the river banks, and these likewise felt the disastrous effects of the overflowing waters. Thus it was that here at Sacramento the river rose to a higher and higher level. Dikes were used, and these in their turn were overflowed. The streets were raised, and still the process went on.

Here, then, was a conflict. The agricultural and commercial interests were arrayed on one side, and the hydraulic miners on the other. The riparian Franks went to war with the gold-gathering Burgundians of the mountains. The contest waxed furious. Never was a suit in any court pressed

with more vigor and determination. The issue was made along the old lines of the common law. The people below asked that the people above be enjoined from ruining the California plains by their nefarious business. The miners resisted to the utmost, contending for the rights and interests of their great industry; but the other party prevailed. The cause was carried to the Supreme Court of the State, and the injunction which had been granted below was declared valid for all time to come. As a result hydraulic mining came to a sudden end, not, however, until a considerable modification had been effected in the river levels of Upper California. This is why we find to-day on the banks of the Sacramento, where he traverses the capital city of the State, these high dikes to prevent his ravages in times of flood, and this is why the city of Sacramento in all of its older parts has a squatty appearance.

During the interval between his arrival and nightfall the writer enjoyed the pleasure of a brief call upon that distinguished California senator, Newton Booth, whose voice, some years ago, was among the first and clearest to ring out like a clarion against the encroachments of those tremendous monopolies which have become, in some sense, the menace and nightmare of our republican institutions.

Sacramento is a large and flourishing city. Its present population is, according to my estimate, some forty thousand. It is a commercial metropolis. I am not aware that manufacturing enterprises have obtained much foothold; and I should think that merchandising is here the most profitable pursuit. One thing impressed me as peculiar to the situation, and that was that Sacramento is less given to hyperbolical diction with respect to her own merits and prospects than almost any other city, big or little, in the Golden State. Civic modesty is not a virtue generally distributed in the municipalities of the West; but Sacramento is an exception. She respects herself, and has the confidence of a well-bred lady who knows her merits, but is rather too proud to say much about them. The city is well laid out. The State-house, at which the citizens have prepared an evening reception for our Society, is an admirable structure as to its architectural qualities and adaptations. It is in the Hall of Representatives that our banquet has been spread, and here, in the evening, we are greeted and welcomed by one of the most élite and hospitable throngs of people that we have ever met. They treat us as their friends and acquaintances. They escort us to the banquet hall There we are seated at elegant tables, each for six guests at a sitting.

I have already referred in advance to the elegance and refinement of our Sacramento banquet. It was a nonpareil affair from beginning to end. The arrangement of the tables, with their beautiful flowers and elegant array of fruits and viands, gave unmistakable token of woman's hand and taste. An excellent programme of speeches and music had been prepared for the occasion. The principal address of welcome was delivered by Postmaster R. D. Stephens, who gave us a cordial greeting and all hail to

the capital of the State. One attractive feature of the evening's entertainment was the fine music on the piano-forte and zithern, by Professors Ollert and Lennet. Appropriate addresses were also delivered by Hon. A. L. Hart and Hon. L. W. Maslin; and then came the presentation to each member of the Society and visiting guest of an impression of the great seal of California, the same being made by Hon. W. C. Hendricks, Secretary of State. The addresses in response were made by President Parker Earle, who, on such occasions, always did honor to the Society and himself; also, by Vice-President T. V. Munson; J. M. Smith, of Wisconsin; Hon. M. M. Estee, of Napa; Hon. Nelson Bogue, of New York, and the writer of this sketch. It should be said in this connection that by the time of our arrival in Upper California our abilities as post-prandial rhetoricians had been much improved by practice. It is an old saw of Dr. Johnson that repetition brings facility. After the speech-making of our banquets our hosts always roundly applauded us, and we applauded them. Since we were generally in the majority, our applause prevailed. It is a great thing to be Americans.

Let this also be recorded, that we did not at our Sacramento banquet simply sit down and eat and eat. Many of the most distinguished ladies of the city did us the honor of their company to the tables, where the conversation and merriment were more pleasing to us, who still had a memory of Napa and St. Helena within us, than the good things which were disposed in the vases around us.

It was part of the magnificent accommodations furnished us by the Southern Pacific Railway that we should have the benefit of our sleeping-coaches everywhere and at all times. It required but a few minutes for us, at any time, to have the rest of our Pullman cushions by day and the privacy of our berths by night. After the Sacramento banquet we bade our hosts farewell and were soon asleep in our coaches. With the coming of morning we rolled away from the capital, not without regret. At the middle of the forenoon we passed the town of Marysville, where, at a later time of day, we were to have—what do you think, O reader?—a banquet.

For the present we whirled on to the north, and a little before noon reached our present destination, at Oroville—that is, in the tongue of our fathers, Gold Town. Senator Jones, of this county of Butte, and a delegations of citizen with carriages, met us at the station. Oroville is another of the newer towns of Upper California, though the place has been known and inhabited since the time of the first excitement following the discovery of gold. Indeed, it is only a short distance from this place to where the great discovery was made; that is, the alleged discovery. The Spaniards had for a long time known of the existence of gold dust in paying quantities in this region; but it remained for Captain Sutter's mill-race and the spring of '48 to set the news a booming round the world.

Our hosts at Oroville were anxious for us to see and admire the horticultural resources of their country; and we saw and admired. The reader will be surprised to know that away up here on the banks of

Feather river, at a distance, as the crow flies, of four hundred miles from Los Angeles, and over five hundred miles from San Diego, the orange trees, and even the lemon trees, growing in the open yards were laden with fruit, as in the far south, and that the evidences of the winter's frost were scarcely more distinctly seen on the leaves and branches here than on those at Santa Ana and Riverside. A strange climate is this. You can not generalize about it at all. The climate of every little district is its own. It is astonishing to find away inland little whorls among the mountains and patches of valley so situated as to receive the warm breath of the far Pacific and to feel the genial caresses of that influence the year around. I say you can not generalize about anything in California. Everything is local and peculiar. Each district is a study. The very mountains are personal. Each river has its caprices and individuality. One of our company frankly and fully summarized the whole business by saying, "This country beats the dickens." That is true, my friends. Whatever that great philosophical fact called the dickens may be, it is, I think, the precise term with which to define the climate of California; and I am obliged to the genius who first made the application.

Meanwhile, we are bowling along through this somewhat broken but very beautiful country around the town of Oroville. We have a drive of two and a-half hours. We see the young city with its orange trees in the yards and orchards. To tell the truth, however, we had now become so much accustomed to this thing that it had somewhat palled on our senses; and we were delighted when our cavalcade drove into the great gold-mining plateau northwest of the town. Here every faculty was keenly awake, and our people quickly jumped from the carriages to inspect the field where the great hydraulic engines had done their work and then disappeared after their battle with the riparians on the banks of the Sacramento.

The scene was really wonderful. Yonder are the mountain-sides against which the tremendous torrents of water had been directed; and here, over a vast area almost level, are spread the bowlder wrecks of the devastation. Here are sections of the old sluices down which the torrent rushed. They are still filled with running water, but it is now directed to the distant fields and orchards, where its fertilizing power is to be manifest in fruits and flowers. Turning again to the city, we see in the distance, to the right, the little town of Thermalita, recently platted, and already claiming its place as a flourishing young community. At Oroville we did not banquet, for the reason that the Southern Pacific had kindly provided otherwise. Certain it is that the city could have fed us, and then taken up twelve hundred baskets-full of fragments.

The town of Oroville is on a branch line of the railway leading from Sacramento to Redding. It is the present terminus of that line. After leaving the place we returned at once to Marysville, where we were received in the usual way and were banqueted with the usual profusion. Here again the abundance of wines was noticeable at the festival. It is needless to re-

peat what has been said of the other civic banquets tendered to our Society with respect to our feast at Marysville. It was as bountiful as the rest, and as full of good will and generosity on the part of them who gave it. Our stay in the city was brief. The schedule made it so; and as a consequence our view of the town and its surroundings was less extensive than at many other places. It is due to say, however, that our brief glance at the growing town and the products of the country around it satisfied us as to its prosperity and promise.

Early in the afternoon we whirled away on our ascent of the valley as far as the town of Chico. At the outset of this sketch the author begged the privilege of painting his landscapes with his own paint and brushes. He assumes that that privilege was granted; and so here is what he sketches of the city of Chico: He thought, and thinks, that there was manifest in this town, and by the people thereof, more enthusiasm and, if he must descend to vulgar speech, more get-up-and-get than at any point which we visited in Upper California. To begin with, the whole population were out to greet us on our arrival. The streets about the station were black with people. The balconies were full of them, and some were on the house-tops. They had the best band which I heard in all California, excepting only that of the Palace Hotel. As we rolled into the station there was a regular blast of music. The platform blossomed with handkerchiefs; and a long row of elegant carriages flashed in the sunshine.

A great part of the excellence of our reception at Chico must be attributed to the energy and influence of its most distinguished citizen, General John Bidwell. He was at the head of the delegation to receive us, and gave direction to our course through and about the city. I must say, *en passant*, that General Bidwell is, in his personal appearance and address, one of the most impressive and dignified characters whom we met in California. He has not only a magnificent physique and urbane manners, but also a notable history. In his youth he was the owner of an estate in Missouri, but lost it by some fraudulent process directed against his title. Disgusted and angered with this disaster, he left what was then the extreme west of the United States and took his course toward the sunset. He was with a small company of adventurers, like himself, searching for fortune in some land where legal technicalities could hardly stand against equity, particularly when the latter was backed by physical courage.

This was in 1841. It is thought to have been the very first company of white men that ever crossed the Sierras into Upper California. General Bidwell procured, at length, here at Chico, a vast claim to one of the most fertile regions imaginable. His ranch to-day has an extent of 23,000 acres. It is one of the best, if not the very best, estates of its kind in California. It is a fruit-growing ranch, not a vineyard, and is in a better state of development than any other which I visited during our stay on the Pacific coast. By this I mean that General Bidwell's orchards are older and more matured than any other through which we passed on our tour. The General himself

headed our company on the drive through the grounds about his residence and through the long avenues separating orchard from orchard, until the eye was actually weary with measuring their extent. The ranch produces almost every variety of fruits, but the stone fruits are predominant.

I believe that General Bidwell lays no stress upon producing oranges or any of the genus citrus; but you should see his apricots, and plums, and peaches, and French prunes, and cherries, and figs, and English walnuts, *et id omne genus ad infinitum.* These are the largest and finest trees that I saw in California. Of all the positions which the private citizen may occupy, I know of none in the limits of my observation which can quite compare in independence and real dignity with that of this leading citizen of Chico. While sweeping along through one of his lanes, bordered with fruit trees, the General pointed out to us one of his cherry trees which, in the summer of 1887, yielded him 1,750 pounds of cherries!

On one part of the great ranch is a colony of civilized Indians. They are the descendants of those Diggers who have been regarded as among the least promising of all the Indian tribes. Here, however, their character and circumstances are greatly changed. They are polite, well informed and fairly educated. Their village has its school-house and its church; and I should judge that the relations between them and the General are most amicable and mutually desired. One of the leading red men of the settlement rode with us, in our vehicle, about the ranch. On our course I noticed a fine establishment of bees in a little glade among the orchards. In those parts of California which we visited the apiary was more rare than I had expected, and the sight of the well-arranged colonies in General Bidwell's grounds was delightful to all philapians, of whom the writer claims to be one.

The city of Chico is a credit to this part of the Sacramento valley. It is a delightful place as we saw it. The country is level as a floor. The soil is dark and rich and deep. There is an appearance of enterprise. Our whole out drive, it is true, was within the limits of the Bidwell ranch; but when it is remembered that this of itself covers almost exactly the area of one of our Middle-State civil townships of thirty-six sections, it will not surprise that we did not see beyond it. On our return through the town to the station we were again greeted by the great throng there assembled, who, with music, and waving handkerchiefs, and ringing cheers, bade us adieu as we steamed away on our voyage.

Late in the afternoon of this day we arrived at the little town of Vina. Perhaps the name village might better define it. Indeed, we might have run through it without noticing the station, but in that event we should have passed without heed one of the most interesting places in Upper California. It is made so by the fact that here is situated the great vineyard of Senator Leland Stanford, said to be the largest in the world. It contains in a single body 3,575 acres. If my computation was correct, the vines number 2,860,000. These figures convey no adequate impression of the extent of this marvel among the vineyards. The grapes are of the wine-producing

variety, I think exclusively so. The winery is established in the town, not far from the station. A short walk brought us to it. It is of almost inconceivable dimensions and capacity. In the season of vintage the grapes are brought in wagon-loads to the winery, and carried aloft in elevating cars, where they are discharged into four great crushers. These are capable of receiving and crushing four hundred tons of grapes per day. I suppose that a large wagon-bed would not hold more than a thousand pounds of grapes in the bunch. At this rate you see that the crushing apparatus has a capacity of eight hundred wagon-loads per diem! It is almost incredible; but our information was received from the superintendent of the winery himself, and can not be doubted. After the crushed grapes have fermented with their own juice in the vats they rise to the surface, and the wine is drawn off below. This is then stored in the great casks to await maturity. The capacity of these casks in the Stanford winery is 1,500,000 gallons; and we were told that at the time of our visit more than a million gallons were in the casks.

After a brief examination of this marvelous industry, and just at nightfall, we hurried away to Redding, which was the northern terminus of our tour. On our arrival it was already dark, and the evening was rainy, greatly to the chagrin of the people. The citizens had prepared for our reception, and had spread a b-n-q-t for our benefit. They had done their best, too, and, I believe, were justly proud of the display which they were able to make. You will see from a glance at the map that we had now reached the uppermost limits of the great valley of the Sacramento, and from the elevation it might well be inferred that we were out of the range of fruits and flowers in their season. But not so. The fine reception cards which the committee had provided for us had pinned to each an orange leaf taken from trees in full exposure in the yards and orchards of the place, and every leaf, notwithstanding the unprecedented severity of the recent squall, was as darkly green and fresh as though frost had never been. These cards were brought away with us as trophies, and mine is now before me. Our banquet was in an upper hall. Redding is, as yet, a sort of frontier town, but the evidences of that fact around us abated no whit from the excellence of our entertainment, and its enjoyment by the recipients. The speeches this evening were unusually good. One delivered by a young lawyer and politician, whose name I regret to have forgotten, was really a piece of eloquence and good sense in rare combination. The officers and members of our Society were also fairly happy in their responses—not happy because of anything they had taken, but their speeches had the quality of happiness. The festival ended, and again we sought our berths.

The cards of invitation just referred to were very elegant in their way, having a fine engraving on each of old Mt. Shasta. Shasta, we soon found, is the tutelar divinity of Redding. True, his lordship is sixty miles away, in his habitation of snow, but in this clear air that distance is only a span. With the early morning we are out to see the town, not much of a city as

yet, but declaring herself, with great emphasis, to be in the line of the succession, aye, to be first in the succession of great places. At the eastermost end of the principal cross street is a rise, toward which the straggling tourists took their way at sunrise. They went thither to get a view of Shasta. His place yonder above the mountains is plainly visible, but the giant himself—ah! miserable misfortune for us to have it so—has this morning pulled his cowl of clouds around his head and shoulders, and will not be seen.

So with the morning we turn our faces to the south, from this upper end of the Sacramento valley, and begin our voyage of return. Only two stops are contemplated now until we shall reach San Francisco. A deputation from the town of Red Bluff and another from Woodland had joined us, to urge our stopping with them on our way. Red Bluff is similarly situated to the other towns already described. It is also similar in appearance, in resources and in promise. It has its things to boast of, and its boom. We were received with the greatest cordiality, and the speaker who addressed us from a hack did himself honor, and closed by proposing to ride with the handsomest lady which the Society could furnish him. She was promptly brought forth, and her name was —? Her residence ? The writer and his immediate companions had the pleasure of being taken up by Andrew Knetzer, Esq., an old-time Hoosier and a Forty-niner. Away we went through the town suburbs, across the level plain, somewhat sandy in this region, and slightly reddened, as I supposed, with protoxide of iron. It is an agricultural and fruit-growing region, rich enough to satisfy, and in a state of progress and development. Our stay was brief, as our schedule required our presence at Woodland by the middle of the afternoon. So, with the usual hurry and farewells, we are again aboard, and rapidly whirling on.

I will venture to send the greetings of the Society to the deputy of Woodland, who came to meet us, Mr. W. M. Coward. I do so not more as a compliment to the most magnificent physique I saw in California than as a word of respect for those excellent qualities of mind and heart without which physical manhood is of little use. At Woodland we had our last banquet in the Sacramento valley. It was a good one, too, and was administered with wholesale generosity. I will not enlarge upon the promise of the young city, or the fruitfulness of the country round about. On these topics the narrative, I fear, has already dropped into repetition. But Woodland is as good and pleasant as the rest. Our local excursion carried us to the interesting ranch of Mr. R. B. Blowers, who gave us an instructive experience in the matter of irrigation. Woodland's specialty, as she claims, is her abundance of water at a very limited depth underground. From fifteen to thirty feet generally brings the digger to a supply which might well satisfy old Aquarius himself. It is on this line that Mr. Blowers has supplied his admirable ranch with water for irrigation. His well was certainly *well enough* for the purpose—the biggest and most copious I ever saw. Near by were the engine-house and a tremendous double pump, and yonder, at the distance of thirty yards, was the issue pipe, about fourteen inches in diameter; turned

up as to its end. Out of this came bulging and boiling, to the height of several feet, a column of water sufficient to wet a desert. From this source of supply conduits extend to the various parts of the ranch. Nor do I forget, ere we take our way for the metropolis, to mention what the ladies of the mansion, the daughters of Mr. Blowers, I believe, had prepared for us in the way of souvenirs. They had gathered some of the beautiful ivy leaves from the yards, had varnished them to an exquisite finish, and put thereon, in gold leaf, their monogram of welcome. Thank you, O ladies and maidens of Woodland, and good-by.

We are now on our way to San Francisco. It is not yet night, by any means; and if Vice-President Munson and Mr. J. H. Wheeler, Chief Viticultural Officer of California, and Mr. Bogue, and other distinguished friends, who occasionally gather in the lobby of the Pullman to settle such little questions as the origin of life, the genesis of nature and the first principle of human action, will excuse me for a little while, I will indulge in a brief reverie about the transformation which has taken place in the industries of California.

At the first, you know, the old American Californians, as distinguished from the Spanish-Mexican Californians, were diggers of gold. That is what they crossed the plains and the mountains for. They poured into these regions as adventurers, and flourished as miners; that is, they flourished at intervals. I learned the history of many of these old mining heroes. It is sometimes, most pathetic. One of the lines of Defoe, I believe, runs in this wise:

"Full thirteen times have I been rich and poor."

This statement of the case will hardly do justice to the career of many an old Forty-niner. I have heard, from what I consider good authority, that more than one half of the brave fellows who rushed from the older States to yonder gold diggings in the summer and fall of 1849 are now in indigent circumstances, and that many of them are the recipients of public aid and support. I am sorry to hear it. I have not seen one of the old fellows in all this journey without a kind of warming of the heart for him and his career. They were a brave band, and, with all their recklessness and prodigality and wasteful flinging away of their gold dust in folly and hazard, they deserve to enjoy a full share of that wealth which their hard hands grabbled from the sands of the rivers and the *débris* of the mountains. To every Forty-niner whose worthy hand I had the pleasure of shaking in the Golden State—golden to him, I hope, in memory—I send a cordial greeting

So, then, the first industry in California was the mining of gold. Every other enterprise, at the beginning, was second to this. The early communities arranged themselves with respect to the supply and distribution of gold. Gold made Sacramento, and gold converted the Spanish Yerba Buena into San Francisco. Little or nothing else was thought of as it respected the possible industries in the Eldorado. I was told, by those who saw the California valleys in that day, that no one would have imagined

them susceptible of reclamation from the wild dominion of nature. As for the mountains, they have not yet been reclaimed, and I hope will never be. They say that the lowlands, in the times of the mining fever, were covered with such rank growths out of the fecund bosom of the earth as could not be paralleled or imagined. A gentleman told me at Pasadena that he saw that valley when it was covered with a growth of weeds so high that a brigade of cavalry would have been swallowed up in the brake. Thus, mining was everything. And the evening and the morning were the First Day.

But, in course of time, a change swept over the industrial landscape. It was found that another source of wealth, as golden as that of the hills, existed in the soil. As the valleys were cleared of their weeds rich grasses took their place, the succulence of which invited all them that chew the cud to fill themselves with the juices and fibers of this tender vegetable life. So came the cattle, and so came the sheep. Their name was legion—herds here and herds there and herds everywhere. They multiplied to thousands. They lay like shadows on the distant plain. They yielded all manner of profit to the rancheros, who scarcely knew their own, for multitude. So came the heyday of cattle-raising in the valley lands of California. It was one of the greatest of harvests; but, like many other of the rich things which crown the industry and enterprise of man, it endured but for a season. Not, indeed, that the resources upon which it was founded failed, not that the products of the herd, yielding some sixty, some a hundred fold, were less valuable than when the new industry was in its prime; but the epoch passed by natural evolution into a new phase of industrial life. And the evening and the morning were the Second Day.

A third form of enterprise now made its appearance, promising, if possible, still greater rewards. It appears at the present day, through our clear backsight of the situation, that the great fertility of the soil of these valleys would have been one of the most patent facts, even to the first inhabitants; but such was not the case. Adventurers ran pell-mell over the riches under foot, to find the more glittering, but hardly more palpable, wealth of the hills. Long before the beginning of the decline in the great stock interests of California the third phase of industry had appeared in the cultivation of the soil. The old Californians were at first dependent upon importation for almost everything which they consumed. They produced nothing, and purchased everything. The things eaten were a foreign product. Even the meats, with the exception of game, which then abounded, were brought from foreign markets. But, with the beating about of enterprise, the people came at length to discover the wealth of the soil; and here began the third great era of the industrial life of the Pacific coast. It was farming on a large scale. It is needless to say how great was the yield in this form of industry. The leading products were wheat and barley and oats; and all the cereals came in the train. Then it was that fields, the vastness of which made the eye of the beholder ache with the distance of their further borders, spread out on every hand. The agricultural resources of the State became enormous, and

it was not long until foreign and distant markets felt the impact of new tides which had their rise in the granaries and mills of California. And the evening and the morning were the Third Day.

With the increased agricultural development of the State there came to pass a conflict between the farmers and the cattle ranchers, similar, somewhat, to that already described between the riparians and the hydraulic miners. This is to say that, as farming increased, the difficulty of conducting the cattle and sheep ranches was augmented. The fence question was at the bottom of it. The immense farming regions could not be fenced in. Where was the timber for it? Where was anything else in sufficient abundance to bound so vast inclosures? The herds, wandering over the valley plains, drifted into the growing fields; and the farmers cried out against the herdsmen. About a decade ago the No-fence Law was passed, by which the farmers were relieved of the necessity of fences and the whole burden was thrown on the ranchers. It was a crushing blow. Since that event the business of herding has, I think, rapidly declined in nearly all parts of California. It has given place to the third and, more recently, that fourth form of industry which remains to be noticed.

This fourth form is the horticultural phase. I suppose that it originated in discovery; that is, it became, in course of time, a patent fact that California was the place for raising fruits. It was found that the garden, as well as the vast field of the farmer, was a source of limitless revenue. In the old Spanish times it was already well known that the grape abounded and flourished in these regions; but the fact was of little utility to them. From the days of Philip II. to the days of Don Carlos the Spanish race has been about the poorest in the world in the way of applying knowledge to the benefit of men. It appears that the discovery of the fruitfulness of the lowlands of the Golden State in the products of the garden and orchard came on as Shakespeare's description of love, like a rose in the night. One morning the Californians woke up and found themselves famous on account of their fruits. It was almost like the finding of gold in Sutter's mill-race. The fruit-growing boom came on, and California entered the present stage of her industrial development. And the evening and the morning were the Fourth Day.

Thus we find that four tolerably distinct epochs, or, as a son of Israel would say, four *yoms*, have successively appeared in the industrial history of California. The first was the Day of Gold, the second was the Day of Cattle, the third was the Day of Wheat, and the fourth the Day of Oranges—sometimes called the Day of Grapes. According to my horologe the Californians are now about ten o'clock in the forenoon of the Day of Oranges. These reflections may serve, perhaps, to explain the fact that Sunday is so little observed in California! The Golden State has not yet reached the Day of Rest in the cycle of her creation. Meanwhile, our engine has plunged, headforemost, into Oakland, and issues on the pier with his eye on San Francisco.

CHAPTER VI.

SANTA ROSA AND SAN RAFAEL.

Valley of Sonoma.—Cattle.—Horses.—Landscapes.—Guerneville.—The Redwood Bottoms.—Reception at Santa Rosa.—Banquet and Speeches.—Local Excursion.—Return to San Francisco.—Invitation to San Rafael.—Hon. Wm. T. Coleman.—The Reception.—Excursion Through the Coleman Estate.—The Mountain View.—Bull's Head Breakfast.—Menu and Speeches.—Back to the City.—Compliments to Messieurs Coleman and Louck.

Once more we have a night in the metropolis. If we should fail in the early morn to be off for Sata Rosa, the people of that fine city would never forgive us. After a night's rest in the Palace, we are again on our way through the agreeable landscape north of San Rafael. This is the county of Sonoma, one of the oldest and most fruitful divisions of California. This is said especially of the production of grapes. There is a rivalry between Sonoma and the Napa valley as it respects the excellence of their respective vineyards. The traveler through either might call it the best until he had seen the other. The country between Saucelito and Santa Rosa pleased me very much, because of its green, Hoosier-like pastures and slight irregularities of surface in the valley lands. I have already referred to the general dead level of the California valleys. This fact is a great good fortune to all those districts dependent in whole or in part upon artificial irrigation. I believe that the people of Sonoma county have no need to go beyond nature for their supply of water in due season.

I saw some fine cattle in this region, on the sloping pastures. As a general thing, my impression was, and is, that the California herds are not well bred up; that is, the cattle are of lower grades than ought to have been reached years ago. This is not true of the sheep. The flocks seen in the San Joaquin and Sacramento valleys were largely of Merino extraction, well formed and fine as to their woolly coats. I may add that the California horses present two phases of equine development. In the outlying districts the bronco is prevalent—an unlovely quadruped as to his temper, and of no taste in architectural construction. The bronco, O reader, is a cross between an actual horse and the wild pony of these western plains. In size he shows some evidences of civilized descent; but his manners and moral character are deduced from the pony side, and have in them many suggestions of sage-brush and chaparral. The other aspect of horse-life in California is very different. These are the fine, well-bred animals, Normans, and Clydesdales, and Cleveland Bays, which you see about the liveries and parks of the larger cities. Here we find some of the finest horses in the United States. I think it was at St. Helena that I rode behind two splendid dark bay Norman colts, about two and a half years old, each weighing nearly sixteen hundred pounds. They were splendid fellows, gentle as Newfoundland pups, still a little awkward as to their harness, but perfectly tractable

in the hands of their driver, who was an old Forty-niner. The carriage and saddle-horses seen on the boulevards winding out from San Francisco to the Golden Gate are as fine and swift as those that dash with uplifted heads through the drives of Central Park, or the Bois de Boulogne, at Paris.

The schedule for the Santa Rosa excursion carries us first through the city and onward to the little town of Guerneville. As you ascend the valley that unevenness of surface of which I spoke above becomes more pronounced. In fact, by the time we reach Guerneville we are again among the mountains. At least, they press us pretty closely on either hand, especially the right. It is a general fact in the landscape of California that the mountain chain begins from the valley. There does not seem to be any broken region or hill country between the range and the lowlands. I saw only a single hill in all California, and that was a mound. It rises on the east side of Pasadena. Here, about Guerneville, are some mounds. You might call them hills, but the language is not orthodox. On their slopes are vineyards clear to the top. There is running water in this region, a thing most grateful to the eyes of our people, and willows grow on the banks, and cotton-woods—which brings us to the subject of trees again.

It was the tree that brought us to this place, the big tree, the redwood, on his native heath. And here, sure enough, before we reach Guerneville, and still more abundantly beyond, is the redwood forest—that is, *was* the redwood forest before it was murdered by the lumbermen. O man, whoever thou art, thou shouldst see the stumps thereof. Here is the big bottom about the little town of Guerneville, and the whole area is covered with the stumps of the giants fallen. "It came to pass on the morrow," saith the Scripture, "that the image of Dagon was fallen from his place, and his hands and his feet were broken off, so that nothing was left of Dagon but the *stump* of him." So it is, alas! with these gigantic trees.

The general good fortune that attended us on our excursion now failed us for a day. The railway which has brought us hither is called, I believe, the Pacific and Oregon Railway; at any rate, it is the road owned and controlled by Mr. Donahue, who honored us with his presence on the following day at San Rafael. On the night before our excursion to Santa Rosa a heavy rain fell in the district between Cloverdale and Guerneville and washed out some bridges. This accident prevented us from reaching the living redwood forest. We were obliged to stop at the town and content ourselves with wandering among the stumps; but the scene was enough to astonish as an indication of what had been, before the devastating saw-mill had done its work.

The reader must understand that the big trees, so-called, of California are of two species: the redwood, *Sequoia sempervirens*, such as we found among the low mountains between Santa Cruz and San José, and such as we find here about Guerneville. These, however, are not the true big trees of Mariposa. The latter are called the *Sequoia gigantea*, and are considerably larger and more grand than any true redwood. The stumps which we find

in the bottoms about Guerneville range from eight or ten to twenty-one feet across. It is proper to say, however, that the stumps of these trees give a somewhat exaggerated testimony as to the size of the trunks. The redwood flares out as it approaches and enters the ground. It does not come straight down to the earth, as a black walnut or yellow poplar, but widens and sends out flanges. The lumbermen saw the trees down by a section about eight feet from the ground, but even at this height the tree is swollen considerably beyond its diameter, say fifty feet from the earth

The wood and bark of the redwood have been a hundred times described. I will add, however, a touch or two to former contributions. The great mass of brown bark lying between the outer and rough coat and the sap of the tree is susceptible of some of the finest appearances imaginable when it is properly cut. Take a piece of it, thoroughly dried, and cut it in cross-section with a fine and rapid band-saw, and the surface will present a seal-brown velvet, fluctuating to the touch like plush, and giving off rich gules when held at an angle with the light. In this form it makes most elegant cushions for pins, needles, and, indeed, all such instruments of torture. A remark may also be added with respect to the wood. It is, certainly, the most splitable of all vegetable fibers. With a good, strong pocket-knife you can rive a fence-rail into long fine splinters, so perfect and free is the grain. Nearly all the wooden buildings in this part of the country are made of redwood. The yield of lumber from one of these forests reaches out toward infinity. The Santa Rosans, later in the day, showed us a handsome and commodious church in the city which was made, from sill to pinnacle, from the lumber of a single tree.

After a stay of an hour or two at Guerneville, we returned to Santa Rosa, which was, indeed, the principal aim and end of our journey. I should estimate the population of the place at six or seven thousand, may be more. One of the best of our receptions and banquets had been made ready for the arrival of the Society. A delegation of leading citizens conducted us to the opera-house, and there made to us elegant and appropriate speeches. Thus did Colonel M. L. McDonald, and thus did Dr. A. F. White and Mr. H. W. Byington. The responses were by Vice-President Munson and Messieurs J. H. Masters, of Nebraska; Professor Van Deman, of the Division of Pomology at Washington; J. M. Smith, of Wisconsin; G. P. Peffer, of the same State; Dr. O. P. S. Plummer, of Oregon; and J. C. Ridpath, of Indiana.

The local excursion through the city and surrounding country was under the direction of Hon. M. L. McDonald. It was a delightful drive, through a region most fertile, rich in growing fruit trees, and beautiful by adornment. One of the most exquisite views I had in California was from the high ground in the cemetery, looking toward the sundown. On our return to the city our section of the cavalcade passed through the beautiful grounds of Mr. McDonald, where everything that artistic taste

and refinement could suggest had contributed to the variety and ornamentation of the premises.

Santa Rosa, with many other of the California towns, has paid and is still paying close attention to the tree-growths in her streets. They are lined on both sides with fine rows of eucalyptus and pepper trees, and furnish as handsome drives as may be found in any of the outlying towns of California. Before reaching the city, I noticed in a suburban pasture the finest Jerseys that I saw in the State.

The banquet over, and the sights seen, we gather again to our coaches and are away. Now, for the fourth time, does our journey bring us to San Francisco for the night. I have not yet attempted to say anything *in extenso* about the metropolis, and will not for the present. Our stays, thus far, in the city have been so brief as to prevent a general scrutiny of its points of interest. For the present, it is better that we take a nap at the Palace, or run out, at the risk of small-pox, to Chinatown, or see a play, or hear a concert, or traverse the brilliantly lighted streets, according to our several tastes, until the suggestions of tired limbs compel all to the quiet of slumber.

The 4th of February was a red-letter day for the Society. Not that the sensation lay in the direction of horticultural refinements, or meretricious exhibitions of art; but a novel experience was in waiting for us. An invitation had been extended to the Society, by Hon. Wm. T. Coleman, to visit him at San Rafael, and to accept at his hands the compliment of a bull's-head breakfast. But what is or was or might be a bull's-head breakfast, anyhow? It was a conundrum to our company; and, as the event proved, some grotesque suggestions were made as to how we should demean ourselves on the occasion. Of a certainty, it was a royal piece of business from beginning to end. None who were participants will ever forget it—none cease to smile with the rising memory of that novel and delightful feast.

At the wharf, with the early morning, we receive our tickets. We take the San Rafael and cross the bay. The breeze in this harbor of San Francisco is exhilarating, and the waters flash out from your boat in long lines of light. Mr. Coleman has provided everything conducive to our pleasure and profit. On our reaching the station, the carriages are in waiting, and we are received for an excursion through the precincts of the beautiful town. It is one of many, but perhaps the most delightful of the suburbs of San Francisco. Everything here is villa-like; that is, outside of the business parts of the little city. Nature was certainly in an æsthetic mood when this valley was planned and executed. Our party, in their carriages, are carried round and round, through exquisite drives winding between rows of transplanted trees, and climbing upward by a kind of mountain road, which Mr. Coleman has constructed through his estates. I believe that the premises embrace about four thousand acres of land. Part of it is valley and part mountain, and the mountains look on the sea.

Among the many magnificent views which I had in California, I call up

two as preëminent over all—one preëminent for beauty and the other for sublimity. From the plateau of the Raymond Hotel, in Pasadena, I believe the scene to have been the most beautiful of any that linger in my senses; but from the top of the green mountain to which we wound our way through the ever-changing landscape as we climbed its picturesque slopes to the summit—and which I venture to name Mt. Coleman—the view is absolutely unrivaled in every element of the picturesque and sublime. Mr. Coleman told us, on this summit, that Albert Bierstadt, standing on that spot, had declared, with enthusiasm, that for artistic effect the landscape spreading across the valley and to the opposite mountain slopes and summits was the best he had ever seen.

After drinking in this glorious view for a brief season we descended the slopes, and were driven through the city. Meanwhile our novel banquet had reached perfection, and was awaiting our arrival at the Grand Hotel. On reaching the same, and entering through the cloak-room to the dining-hall, we did not see such evidences of style in the way of patent leather, cut-away coats, and unctuous waiters as we had expected. Though we were cared for in all essentials, it seemed for the nonce that Oscar Wilde had had nothing to do with it. The fact is, that already in passing to our seats at the long tables we sniffed the first fresh breezes of emancipation. Glancing at the tables, we discovered that they were laden with a few staple articles, such as bread, but not a knickknack from one end to the other, not a flower, not a napkin, nor any other token of nonsensical civilization. But think thou not, O reader, that there was nothing to eat. Per contra, there was much more than much.

Mr. Coleman, our host, from whose abundance and generosity the whole thing had been prepared, took his place at the head of table number one. There were fully two hundred of us. By this time the prim and poker-like demeanor of the men, and what might be uncharitably called the the fashionable simper of our ladies, had given place to a male grin and a female smile. The grin spread out until it was like the entrance to Fingal's cave, and the smile became a rainbow. Explanations were now in order, and Mr. Coleman made them. He said that it had occurred to him to give us, instead of a fashionable dinner, an old-time California feast—an affair of bonhomie and good cheer instead of formalities and refinements. He explained that we were about to be served with a bull's-head breakfast, such as the men of forty-nine and their confreres used to have while civilization on the Pacific coast still retained something of its masculine vigor and vehemence. The affair, he said, would correspond more nearly to what in the older States is called a barbecue than to any other ceremonial of eating. It was the peculiarity of the bull's-head breakfast that all formalities were thrown away, and all constraint abandoned. He hoped his guests would conform to this standard of demeanor. They were here at his invitation to enjoy themselves, and he hoped they would make free with each other and with the banquet, after the manner of his friends in the olden time. The

banquet itself was a thing of Spanish descent, with Mexican modifications and development. He would, accordingly, introduce his head cook to us to announce the bill of fare. That gentleman, accordingly, stood a moment at Mr. Coleman's right, dressed after the manner of his profession, and told us, in fair American English, what he had to serve to us. It was as follows:

1. Cabasa toro con chili e frijoles. This, being interpreted, means bull's head with red pepper and beans.

2. Chili con carni, which signifies red pepper with meat; or, in common language, what is known as a Spanish stew.

3. Poyo con chili, which signifies chicken with red pepper.

4. Boyrago chicito sin chili, which is lamb *without* red pepper.

Here, then, we had four courses announced, three of which were with chili, and one without it. There is nothing chilly about chili; it has a warming effect. Doubtless the lamb was thought by the old Mexicans to be too young to bear the excitement of chili!

But let us go into details a moment. The cook explained to us how the bull's head or heads (if there are more than one) are prepared. First, toro is decapitated; and the head, just as it is, is thrust into a bag like a coffee-sack and sewn up. The bag is then plastered over to a considerable thickness with mud, and the whole is lowered into a furnace or earthen pit, where red-hot stones have produced the requisite heat. In due time the head is cooked, and is taken out; the earthen shell is broken off, the bag opened and the hide stripped away; and there you are. Then comes the seasoning, in which chili is used to an extent which no American throat could bear without an educational course in pepper. To the Mexican, however, and to the old Californian as he was in the days of mining, the red pepper, which is the only seasoning used with meat so cooked, was merely a pleasant excitant to the appetite. Mr. Coleman told us that in our case he had ordered only about a fourth of the usual amount of red pepper to be used. He had tempered the wind to our constitutions.

Now, all ye men beyond the mountains, hear this well. The cooking of meats, as it is practiced among you, that is among *us*, is one of the lost arts. I repeat and emphasize what I believe to have been the unanimous judgment of the two hundred of us who breakfasted with Mr. Coleman, that the bull's head served to us in this Hispanio-Mexican fashion was the most delicious of any meat ever offered to our palates; and the same may be said of the other courses. The whole was one of those life-giving barbacues which the stomach of man understands better than his other faculties. Nothing could have added to the reckless freedom in the enjoyment of which we soon found ourselves. We helped each other and called for more; and so on, to the end of the banquet. The festival was like Homer's Iliad in one respect: it did not conclude, but merely ceased.

Then we had some speech-making, which was, in like manner, emancipated from the formalities of rhetoric and the precise forms of the syllogism. Our host made us an address full of cordiality and good will. He also introduced to us Mr. Donahue, president of the railway over which we had jour-

neyed the day before to Santa Rosa. He, too, made us a happy speech. Two of us responded; and what we said is no matter. The echo of it has died away, and its substance, no doubt, has floated out to sea.

In the afternoon of this memorable day we again boarded our train and returned through the delightful valley, skirting the bay on our right, to the boat, which, in due time, carried us over to the metropolis. It is Saturday night, and we are obliged, according to the programme of the Society, to be in Riverside Tuesday morning. It is more than twenty-four hours thither, and we must make ready for the journey. Mr. Coleman accompanied us to the city. On our way across the bay we had the pleasure of presenting to him the following brief address:

"The Hon. William T. Coleman has to-day added a personal compliment to the many official and public favors which our Society has received since coming to California. At the beautiful mountain garden, San Rafael, which he himself more than any other has made one of the most charming spots on the globe, we have been welcomed and entertained in a manner as hospitable as it was unique. The banquet which he has provided for us has had all the charms of novelty and informality. At his board nature has taken the place of art, and food has been substituted for confections. We shall carry with us to our homes beyond the mountains and recite to our friends no other incident of our stay on the Pacific coast so satisfying to the natural man, so free in its administration and so appropriate in its kind as the banquet given us this day by one whom we shall ever remember as our friend."

In the mean time, and for many days, the Society had been nurturing a grudge against a gentleman who had been with us on all of our journeys from El Paso onward. I refer to Mr. J. B. Lauck, in whose charge we had been placed on our start from El Paso across the plains. He held, and holds, the office of traveling passenger agent on the Southern Pacific Railway. We had not been two hours in his charge, on our way to the Golden State, until we felt the impact of his management and high qualities as a gentleman. He was, in every part of our journey, tireless in his attentions to our comfort and convenience. His activity in duty foreran our wants and developed many things for our pleasure and interest of which, if they had been omitted, we would have been none the wiser. He gained the confidence and then the friendship of our whole company, and, while retaining a sense of his official duty, made himself as one of us from beginning to end of our tour. We had already made up our minds to request of Mr. T. H. Goodman, general passenger and ticket agent of the Southern Pacific, the advantage of Mr. Lauck's presence with us on our way to Riverside, and this was cordially granted. In return for what the latter gentleman had done for us, and as a token of appreciation, the Society availed itself of the opportunity furnished in crossing the bay to gather Mr. Lauck into the cabin, to make him a speech and to put into his hand a few double eagles of California gold. We also invited him to bring Mrs. Lauck among us for introduction and congratulations, and tendered him a certificate of membership in the Society. May they live long and be happy.

CHAPTER VII.

RIVERSIDE AND FINIS.

The Upper San Joaquin.—Appearance of the Mountain Ranges.—Noted Peaks.—Remarks on the Climate of California.—Temperature.—Atmospheric Tension.—Humidity.—Rain-fall in Various Regions.—Climatic Variations as Affected by Man.—The Sea and Mountains in Relation to Climate.—Dryness of California.—Distribution of Animal Life.—The Gopher.—The Marquis.—The Tehachapi.— Big Locomotives.— Death Valley and its Borax Beds.—Cheerful Names.—The Angels Again.—An Ideal Indian.—Colton.—At Riverside.—A List of Personalities.—Riverside Herself.—The Citrus Fair.—Details of the Exhibit.—The Reception.—Speeches.—Local Excursion.—Magnolia Avenue.—Highway and Border Trees.—Orange Orchards Galore.—Species of Them.—Break-up of the Excursion.—Slight Heart-aches.—Habits of the Man-Animal.—San Diego Excursion.—The Country Thitherward.—Arrival.—The Del Coronado.—Ocean Outside.—Electrical Cars.—San Diego and Los Angeles.—The Two Harbors.—The Great Hotel.—Ostrich Farm.—Habits of the Alleged Birds.—The Pacific as He Is.—Country About San Diego.—Old Missions.—Good-by, Excursionists.—A Farewell Stroll.—Certain Competitive Quadrupeds.—San Bernardino Trip.—Reception There.—Eheu, Vale!

After another pleasant night in San Francisco, we are again away, on the morning of the 5th of February, across the harbor, through Oakland, to our Pullmans; and we head for distant Riverside, where the second session of the Society is to be held. It is nearly five hundred miles to Los Angeles, and ninety miles additional to Colton, which is the Riverside station on the Southern Pacific. Again the darkness of night makes a long tunnel for us through the upper portions of the San Joaquin valley. It happened to us that in traversing this region three successive times we were in the dark, and, therefore, had no opportunity of scanning the particular features of the country of the great county of Merced. A compensating advantage existed, however, in our passage of the Tehachapi by daylight. Of course, something must be done with these twenty-four hours interposing between the metropolis and our destination. The ladies of our company were always its delight; but even with them conversation sometimes finds an end, and you seek the limited solitude of your own Pullman window to muse in silence on such topics as the landscape may suggest or past associations bring to memory.

Again I say that the philosophers of our section must excuse me from the lobby while we take a brief survey of some subject appropriate to our voyage—say the mountain pictures of California. These ranges lying out yonder and bounding the San Joaquin valley on the east, and on the west as well, are typical of all the chains in the Golden State. They have a

common feature. Once more I emphasize the fact of the clear revelation of all the forms of nature in the California landscape. You see everything as through your Duchesse opera-glass. It is from twenty to forty miles to the foot of those mountains yonder on the eastern side of the valley. These are not the mountains which the children, and adult people too, find and study in their geographies. The latter run up in inaccessible peaks, and have nothing at all of the vast wall-like appearance of the actual range.

The true mountains rise from the valleys in three successive banks. The first of these in California, and, I believe, everywhere, are known as the foot-hills. They are plainly discernible at a distance of five or ten miles, and if you use your glass you can see cattle and sheep here and there upon the sloping pastures. Above and beyond the foot-hills the second bench of mountains appear. These rise about two-thirds of the way to the crest line of the chain. We may call them the middle range. Beyond these rise the true Sierras, looking like the cumuli of a June sky in the Middle States, for their summits are covered with snow and shine with wh teness. The middle range has no snow, but generally bears a forest of spruce, fir and pine. The trees along the line of this range may be generally seen with the naked eye, giving a slightly jagged appearance to the line which defines them from the snow-capped mountains beyond them. Now, all three of these ranges, so far as the eye is concerned, constitute a single wall or battlement in the horizon, dark colored at the base and gradually growing lighter with the ascent to the glittering crest line of snow. If you look carefully you will be able to note the two lines along the mountain-side which define respectively the limit of the foot-hills and the division between the middle range and the true Sierras.

Distance throws all three of these banks together, and makes them, to the casual glance, a single bulwark in the horizon. It rises, as a general thing, to a height of about thirty degrees, where the crest is defined in a long, wavy line of light against the sky. If, however, you journey thither and climb to the crest of the foot-hills, or first bench, you will find before you a descent into another valley, stretching laterally before you, and beyond that valley a wall which consists of the middle range above described; and if you go further and traverse the valley between the foot-hills and the middle range, and ascend to the summit of the latter, you will see before you the still greater descent between those summits and the still more aspiring heights of the snow mountains beyond. Go back again to your train in the middle of the valley, and all three ranges melt again into one, and stand there as a single great wall, rising up in the horizon and dividing earth from heaven.

A word as to individual mountains seen in California. Two of the very best are the great heights of San Bernardino and San Jacinto, standing to the right and left as you enter San Gabriel valley from the south. San Bernardino is rather the finer of the two. He is really a sublime monarch, looking down on the lowlands, and high enough, I believe, to see over his rival

to the Pacific. Both he and his friend on the opposite side of the valley are covered on their upper sides and crests with cedars and spruce. So clear is the air that the traveler in the valley between them sees everything on the slopes and up to the crest with the distinctness given by a spy-glass. The whole surface of these mountains shines, almost glitters, in the brilliant light.

After you enter the San Joaquin valley the best mountain of the Sierras is Mt. Whitney. He is clearly visible from Tulare, standing nearly east of that part of the valley, at a distance of about seventy-five miles. Further to the north, as you journey toward San Francisco, are seen the fine heads of Mt. Goddard, Mt. Ritter, Mt. Dana and Castle Peak; but these lie so far back from the line of the San Joaquin river as to be less conspicuous than Whitney. The glory of the Sacramento valley at its northern limit is Shasta and the Lassen Buttes, both plainly visible from Redding. The highest and best mountain of the Coast Range is Mt. Hamilton, overlooking the valley of Santa Clara. A glance at the map will show the reader that the latter named chain of mountains is really a prolongation of the Mexican Sierra Madre, extending at a coastward angle from Fort Yuma to San Francisco.

References have now been made to the general character of the California valleys, to the ranges of highlands that girdle them in, and, in many preceding paragraphs, to the luminous air which bathes all the landscapes west of the Rocky Mountains. But I have not, thus far, enlarged to any extent upon the peculiarities and special merits of the "glorious climate of California." Climate, I suppose, may be called the general result and coordination of the forces of nature as it respects the atmospheric conditions of a given country. This will embrace, of course, the special considerations of temperature—as to hot and cold; of barometrical pressure—as to heavy and light; of humidity—as to moist and dry; of air currents—as to wind and calm; and of the minor details of dew fall and frost and the rate of vicissitude by which one condition is changed into another. First, then, as to temperature:

California has a mild and equable range, especially along the coast. In some favored situations the variation of the thermometer is only a few degrees during the whole year. In the valleys east of the Coast Range the climate is also mild, but here the temperature rises to a great height in summer. On the San Joaquin and Sacramento plains the degree of 110 Fahrenheit is common in the hotter months. Two circumstances, however, greatly modify this extreme heat in its effects on animal life. The air is so dry and light, and evaporation so rapid, that the human frame suffers but little from the extreme heat. It is the unanimous testimony of the people of these districts that they do not suffer greatly even from the excessive temperature just named. Statistics attest this assertion, for sun-strokes and prostrations are more infrequent in these valleys than in many parts of the country where the upward range of the temperature is less by 20°.

As a general fact, there is neither freezing nor frost in any of those districts visited in our journeys of more than seven hundred miles from north

to south. At intervals both may be expected, but neither is severe. The current winter has been exceptional. The lowest temperature acknowledged to us at any point was at Chico, where a creditable witness reported 11° F. on one morning about the middle of January. In the northern part of the Sacramento valley the register on the same day ranged from 16° to 21°. In the southern valley, even as far down as San Diego, there was frost everywhere, and some freezing, the temperature being within the limits of 21° to 28° F. I believe that so far as the present winter is concerned the places most nearly exempt from frost, so far as the evidence of vegetation may be trusted, were Riverside, Santa Barbara, Santa Ana and San Diego.

In the California valleys the atmosphere is everywhere light and elastic. This quality is especially sensible to those who have come from beyond the mountains. There is something really inspiring and invigorating in the California air. I think that, on the whole, the barometer must show a lower average register in California than in places of equal elevation in the countries east of the Mississippi. I note that the average barometric range along the coast, from San Diego to a short distance north of San Francisco, is from 30.00 to 30.05. I do not know whether or not there is anything of hygienic value in these natural conditions beyond the necessary increase of pulmonary action on account of the lighter air; but the latter circumstance is, of itself, a great advantage to all animals of small or restricted lung capacity; and so far as man is concerned, whether he be sick or well, he immediately feels the revival of his powers and activities.

It is evident from history that the humidity of the atmosphere has had much to do with the development and progress of the human race; but the value of this fact depends upon its correlations with other climatic conditions. In a country situated as Great Britain or Iceland, or the Baltic regions, the prevalence of moisture has been greatly favorable to the powers and dominating force of the Teutonic family of men. Fog is not to be neglected in the history of civilization. The prevalence of ocean mists, tossed up into great masses of nimbus, and then split and poured down in copious showers of rain, has been a part of the constitution of some of the strongest representatives of the race. In other regions the presence of occasional humidity, alternating with a succession of arid conditions, has proved disadvantageous to the vigor of mankind. And still again, we find certain parts of the world of exceeding dryness that are, nevertheless, highly favorable to the development and invigoration of the physical life of man and to the quickening of his intellectual faculties. It is with such situations as those last named that several parts of the Western United States are in analogy and likeness. The climate of California is dry—very dry—but its aridity seems to exercise a beneficial effect upon the people. All animal life, indeed, in these valleys of the Pacific coast is of extreme vigor, quickness of development, strong fecundity, and of full power in its maturity. I do not know whether statistics have, as yet, tested the average longevity of the people of the Pacific coast. I should judge, however, that, notwith-

standing their extreme activity, they are long-lived. I noticed that the age of the older citizens –say the Forty-niners as a class—was generally underguessed; but whether this was due to the climate and manner of life, or to a vigor which the adventurers had inherited from an unusual parentage beyond the mountains, I do not know.

Now, as to the matter of rain, there is only a slight precipitation in nearly all the cultivable parts of California. I believe it will prove of interest to the reader to sketch briefly the amount of rain-fall of the various districts through which we passed on our way to the Golden State and at different points therein. At Kansas City there is already a diminution of the copious rains peculiar to the Ohio valley and even the southern parts of Missouri. The range in different years at that place is from thirty-two to forty-four inches. In the extreme eastern part of the Indian Territory the rain-fall is about the same, but the western parts grow drier, and next to New Mexico it is only twenty inches. In the valley of Red river the variation, say at Denison, is from forty to fifty-two inches per annum. The valley of the Brazos has the same range as the Kansas City region. Central Texas averages about thirty-two inches; and the Llano Estacado from twelve to sixteen inches. Where we crossed the Pecos the average is twenty inches; and at El Paso about sixteen. A part of Eastern Arizona, covered by the upper waters of the Gila, has a rain-fall of from twenty to twenty-four inches, but the western part sinks to less than half that amount. In the Colorado desert, which we traversed from Fort Yuma toward San Bernardino, the precipitation is only from four to eight inches. At Los Angeles the range is from twelve to sixteen inches; and the San Joaquin valley has an average of sixteen. At Napa the rain-chart shows twenty inches; and at San Francisco the average is from twenty to thirty-two. The rain-fall in the Sacramento valley is from twenty-four to twenty-eight inches; and nearer the coast as much as thirty-six inches. When we remember that the average of the Mississippi valley is from forty-four to fifty-six inches, and that the more humid parts of the United States have a precipitation of fifty-six inches and over, we shall be able to estimate the vast difference in the hygrometric conditions of the eastern and western parts of our country.

This sketch is by no means a plea for the climate of California; but the advantages of the drier air must be considered, as well as its drawbacks. Two of these have already been referred to—the exhilarating effect upon animals, including man, and the facility with which all vegetable and animal tissues are put in a state of preservation. One other circumstance of vast importance remains to be considered, as it respects the climatic condition of California. It is this: In the older States of the Union the influence of man in his civilizing work has had a general tendency to deteriorate the climate. In the Ohio valley, for instance, the early climate was better than the climate of to-day. Many conditions have here been superinduced that have been vastly injurious to our environment. The tendency has been

to introduce extremes. The temperature of our winters has descended to lower and lower levels, and our summer has sniffed the clouds. Our rivers have become eccentric under the same influence. Within the last quarter of a century the fluctuations of the Ohio in excess of former measures are for flood height about ten feet, and for low water about three feet, making a total variation toward extremes of fully thirteen feet above the record, say, of 1850 and before. The same is notable in the Cumberland, and the Wabash, and in all the secondary rivers of the Ohio valley. The Mississippi himself is feeling the same tendency, though his volume is such as to make the change more slow. Of course, the bottom circumstance in this unfavorable transformation of climate in the Middle States is the denudation of the country of its forests. To be sure, civilization demands the abolition of the forest, but it is the folly of man which has demanded its destruction, neglecting at the same time to redistribute the tree-growths of the country for the preservation of original—that is, natural—conditions. It is a pitiable fact that man, as it respects his friend the tree, has been a fool.

Now, this general tendency to evil which we are experiencing in the Middle and older States is exactly reversed in California. Here the work of man and the progress of all civilizing forces are, in the very nature of the case, working for good. Instead of cutting away forests, where no forests existed the people of the Western States have, from necessity and instinct, extended their tree-growth where it did not exist by nature. It is not that they are wiser in their generation than we, but the natural condition of their country has driven them to it. They are improving rather than deteriorating their climate; not, forsooth, by forethought and purpose, but of necessity.

All this is traceable to one great underlying condition: in the Golden State the mountains, and not the forest, are the fundamental fact—the mountains and the Pacific ocean. The permanence of the mountains and the sea, and the impermanence of the forest, are the natural circumstances which have given them an advantage. Whatever modifications they effect in nature are tending strongly to improve their climatic condition. As they fight their way out into their broad valleys, which differ not much from deserts, they carry with them, and introduce everywhere, a widening area of better natural environment. While the people of the older States effect an unfavorable modification in the surface of the earth, the people of California, as a rule, effect, and can but effect, a favorable change in their climate and surroundings. These, then, are the circumstances, I think, which may be truthfully alleged to the advantage of the Californians.

On the other side, a word. The country is very dry—too dry for comfort. In many places the sand is an enemy and the dust a nuisance. It invades not only the habitations of men, but the men themselves. During our winter stay in the State there were no high winds, such as our previous information had led us to expect; but there are high winds in California, distressing winds that blow up clouds of dust and whirl them through the

valleys. In some places these winds in summer are hot as a furnace blast, at least for a few hours in the day. Scarcely can men endure the hot breath of this semi-simoom. The vicissitude, however, is grateful. With the coming of evening there is always a rapid fall of temperature. It becomes cool with nightfall; and in nearly all parts of California your midsummer slumbers depend for their comfort upon the comfort.

I will mention one other circumstance relative to the climate of this Pacific State. The atmosphere has a very high electrical tension. I think that a good part of the physical inspiration which the traveler from other parts experiences on coming to these valleys and coasts is traceable to what may be called the fire and fizzle of the atmosphere. You are magnetized; but the electricity is of the static, not the galvanic, variety. You sparkle and snap and stand up as to your hair. The sensations of the thing range all the way from funny to instructive. I believe that the spirits are greatly exhilarated by this condition, and that a man feels better for it, whether he is better or not.

So then, on the whole, I praise the glorous climate of California; I join in the chorus with the Californians themselves; but man is a fault-finding animal; and they must permit me to say that in their country there is on the whole a *scarcity of life;* I mean a scarcity of animal life. What there is is vigorous to the last degree; but I was everywhere struck with the absence or infrequency of those multifarious forms and varieties of living creatures which we have in our Ohio valley forests. I believe I never saw a country with so little life to the square acre as California. It gives to the close observer a strange suggestion of calm and quiet unlike the chattering loquacity, the flutter and splash with which he is familiar, and without which he has a certain sensation of lonesomeness. There were times during my stay in California when, on waking in the early morning, I would have given five dollars to hear a bravura or two from the grand bird concerto in C major, with Madame La Thrush and Fraülein von Lark in the leading parts. True enough, California has some birds, but they are not our kind. Here, for instance, is that universal genius, the great North American crow. He is everywhere, from the rivers to the end of the earth. I saw him on a Yucca palm in Arizona watching the Marquis of Leap. I saw him in the Colorado desert, and circling around a sheep ranch in the Sacramento valley. At Pasadena they have a flock of blackbirds and some robins. On my return, by the Central Pacific, I saw at Clipper Gap some vultures, and in the mountains behind Colfax one or two eagles. Down on the coast there is an abundance of water-fowl, strangely differentiated into (to me) unknown varieties; but the land birds in California seem to me conspicuous by their absence.

So, also, of the four-footed forms of life. I speak of the scarcity of *varieties* rather than of paucity of numbers in a given species. Here and there the ground animals of certain tribes are monotonously abundant. But these thick patches of life are sparsely scattered over the landscape. In the mid-

dle San Joaquin country the universal gopher gets in his work. He is a sort of subsoil surveyor who lays off ground plans for orchards and vineyards and alfalfa fields wholly different from the plans of the proprietor. He obeys the injunction to multiply and replenish the earth. And this brings me to speak once more and finally of the Marquis of Leap, considered in his tribes and generations. I should judge him to be in his chosen districts the most multiple animal in the world; that is, of his size. I estimate that the Marquis, in his full development, weighs anywhere from ten to fifteen pounds. We are here (so long has the reverie continued) nearly to the bottom, or *cul-de-sac*, of the San Joaquin. The station is Sumner Off yonder to the west, at a distance of some ten miles, is the little town and district of Bakersfield. In this neighborhood the Marquis has organized a republic; and the last census showed about a hundred thousand inhabitants.

On the Sunday before our first passage through the valley the people of Bakersfield made a rabbit drive. They build a sort of corral, with wings like the wings of a quail net. Then they surround quite a district of country, and proceed after the manner of a fox-drive in civilized countries. They beat among the yucca palms and cacti until the Marquis is scared from his covert and driven in. It was said not to be a good day for rabbits on the occasion of the drive referred to, but no fewer than 5,800 were slaughtered in the corral. Two weeks before, as I was credibly informed, 6,200 had in like manner, been sent to the Land of the Happy Rabbits. At Sumner station I was shown large photographs of the scene of the butchery, and purchased a copy, which is now before me. The thing is a verity, though it might seem to be drawn from the last edition of Munchausen.

So again we are at the Pass of Tehachapi. In ascending the mountain heights two engines are required to each train; and they are monsters in their kind. The majority of them weigh seventy to eighty tons apiece; but the better class weigh ninety tons. El Gubernador, standing here, on a side track, at the pass, is a regular Goliath of Gath; he weighs 105 tons—the largest locomotive I have ever seen. The ascent to the pass is for many miles slow and toilsome; but, when we have once attained the summit, the going down is as easy as coasting. These mountain passes are the marvel of nature's work, such as she gives us in her higher moods. I suppose that all mountain ranges have their passes, if the engineer can find them. The method of it is this: You enter, from the plain which you have just traversed, the mouth of a cañon. The cañon narrows and ascends as it recedes into the mountain. It also winds about. There is a rushing stream of water in the bottom of it. You would think that the whole valley would be watered with this volume; but not so. As soon as it touches the plain it widens, flattens, creeps out into diverse channels, dwindles, sinks, and is gone. Here is the reason why the lowlands of California are so feebly supplied with running water. It is all far below, in that infinite accumulation of decayed granite which has been descending from the mount-

ain slopes and filling up the valley for ages after ages. The engineer carries the track up this cañon and finds his way to the crest. Then he winds about the peaks, as best he may, until he finds an opening for a descent on the other side, which is, also, through a cañon, to the plain beyond. The ascent and the descent are, alike, so steep as to offer a great difficulty to the locomotive and its load. On the northern slope of Tehachapi the track drops down 1,700 feet in a distance of eleven miles; and the southern declivity is almost as great.

In passing again through the Mojave desert, I will only pause to mention a single fact. It seems that in those places on the earth's surface which appear to be least auspicious there is still, as if by caprice, some great element of wealth. While stopping, on a subsequent journey, at the town of Mojave, I saw some heavy wagons coming in across the desert from the east. They were discharging their load at the station into some freight cars for San Francisco, and the load was borax, pure enough to be put into the druggists' jars. Those wagons had come across the desert a distance of a hundred and twenty miles, from Death Valley; and I learned that the borax miners at that place are now taking up ten tons of their mineral daily. Death Valley is one of the cheerful names which the Californians, that is, the American Californians, frequently bestow on their places of importance. I had the pleasure of looking on a town near San Bernardino which goes by the exhilarating name of Tombstone. How great is the difference in the temper and spirit of the men who have conferred these names to that of the old tonsured padres who called everything San and Santa! The rough adventurer, vehement in manner, bearded like a pard, pick on shoulder and shovel in hand, defiant alike of nature and her fiercest creatures, with a half-sarcastic and half-humorous recklessness, calls one place Death Valley and another Tombstone; but your ancient padre called his mountain San Bernardino and his town The Queen of the Angels. Such is the contrast of national life in its native aspects.

Speaking of the Angels, we arrive there on our south-bound voyage on the afternoon of the 6th of February. We have a stop of less than an hour, and do not venture into the city. On the platform of the station the writer had the pleasure of seeing, for the first time in his life, an ideal Indian. I had become skeptical about the existence of such a creature anywhere in the world. I now denounce myself before you all for my unbelief. The ideal Indian is a fact, for I have seen him with my eyes, though I did not touch him with my hands. Here is his portrait, as well as I can draw it in words: He is a Yuma, about six feet and two inches in height. He is absolutely straight. He is symmetrical in every part. I think I never saw so perfect a form except among the old Greek marbles of the Castellani collection at the Centennial Exposition. His movement is indescribable. It is an animal movement—leopard-like. Though he maintains his upright position perfectly in walking, he seems to give down and rise with a kind of spring from foot to foot. He is swarthy to the last degree, and has a truly Indian

face. He has that jet-black hair which we saw on the heads of the dwellers in the adobe villages of Arizona. I have forgotten how many pounds of hair Absalom is said to have worn about his neck and shoulders, but this Indian might give him the advantage of a false balance and then outweigh his prototype. His hair is twisted up in long curls, which hang down his back, such a mass of them as I never saw on a human head before—that is, on a human head behind.

We are now away to Colton. The region about this town seems to be rather sterile from the drift of mere sand in the vicinity. California surprises by her sudden transitions from one scene to another quite unlike. So it is in this neighborhood of Colton. We are met here in the early evening by a deputation from Riverside, six miles away. The cross-line of the Santa Fe railway carries us over thither, and, in the midst of much excitement as to the possibilities of a night away from our Pullmans, we reach the second principal terminus of our excursion. It is at this Riverside that the last three days' session of the Society is now to be held, beginning on the morrow.

The two cities of San José and Riverside were selected by the officers of the Society, and their correspondents on the Pacific coast, for the reason that each is favorably situated for the production of the citrus fruits, and that each proposed to hold, for the benefit of the Society and themselves, a citrus fair coincident in time with our visit to California. In both cases the programme was carried out to perfection. I have already spoken, in that connection, of the fruit exhibit of San José; and it will remain, in the following paragraphs, to describe the like exposition given by the people of Riverside.

First, however, a word as to the meetings of the Society at the latter place. On the morning of the 7th of February the first session was promptly opened in the auditorium of the elegant Congregational church. The formal proceedings are presented in detail, *in loco approprio*, in this volume. Some general features are all that need our notice in this place.

The President of the Society, Hon. Parker Earle, of Cobden, Ill., has again rejoined the Society, after several days of absence. He is in the chair this morning, and opens the proceedings in his usual affable and dignified manner. Mr. Earle is one of the best of presiding officers. He is courteous in the last degree—a man of fine presence, graceful, and easy in his manners and speech. He is a long-time favorite among American horticulturists, and has been the presiding officer of their leading Society for many years. His unanimous re-election, at the close of the three days' session, attests his continued hold upon the respect and esteem of his fellow-workmen from the gardens and orchards of our country. Hon. Wm. Henry Ragan, of Indiana, the Secretary of the Society, must also come in for a note of well-merited praise. It is to his exertions, more than any other, that we are indebted for the advantages arising from our great excursion to the Pacific coast. He planned it, contrived it, managed it. He, too, has

the confidence of his co-laborers in the highest degree. By many years of assiduous application he has won a place among the foremost horticulturists of the United States, and is justly entitled to the deference and respect which are shown him by all members of the Society. Before the close of the meetings, the President was directed by a committee to hand to Mr. Ragan a package of double eagles, as a testimonial from the membership. Of Professor T. V. Munson, Senior Vice-President of the Society, I have already spoken more than once. Mr. Munson is a scholar and a gentleman, a profound thinker, a close observer, and a most companionable friend. He has a vast fund of information, relative not only to the botanical phenomena of the world, but to other parts of human knowledge. He is ready, with reference and fact and example, for almost any topic of speech or composition. Several of the most interesting extemporaneous addresses made during the sessions of the Society were by Mr. Munson. His good nature, his philanthropy and generous disposition win for him the cordial esteem of all his associates.

Similar praise is due to the Treasurer of the Society, Major J. C. Evans, of Kansas City, Mo. Major Evans, at the present time, is, I believe, the oldest born inhabitant of the city from which he hails. He, too, has gained a permanent hold upon the respect, even the devotion, of the body whose money matters he is appointed to manage. In some parts of our journey he, as well as Mr. Munson in other parts, was the presiding officer; and on such occasions his management of affairs was highly satisfactory. His experience in horticultural pursuits has, like that of the other gentlemen, been very extensive; and I was informed that his own orchards at home illustrated and established the Major's claim to a high rank among the growers of American fruits. Nor can I dismiss his name without a bow to Madame Evans, who accompanied him and us on the larger part of our journey. She is a woman of unusual culture, a Parisian lady by birth and education, who enlivened and enlightened many a passage of our talk as we journeyed hither and yon through the valleys of California.

The constitution of the Society provides for a retinue of Vice-Presidents, one for each State, besides the senior officer named above. Of these not a few were of our party: Mr. N. Ohmer, of Ohio; Mr. J. M. Smith and wife, of Wisconsin; Professor J. L. Budd, of Iowa; Mr. Wyman Elliot, of Minnesota; Mr. J. H. Masters, of Nebraska; Major F. Holsinger, of Kansas; Mr. L. A. Goodman and wife, of Missouri; Mr. W. S. Thomas, of Arkansas; Mr. Ross Lewers, of Nevada; Mr. J. M. Samuels, of Kentucky; Mr. T. S. Hubbard, of New York; Mr. H. I. Budd, of New Jersey; Dr. and Mrs. J. R. Cardwell, of Oregon; Mr. J. Van. Lindley, of North Carolina; Mr. Sylvester Johnson and wife, of Indiana. All of these gentlemen participated ably in the proceedings of the Society, and attested by their manners and talents the possession of high personal character.

To the above list of official names the writer is now impelled to add a few other personalities. He wishes, as far as he is able, to pay a compli-

ment to a few of the many extra-official friends without whose presence our journeys and receptions and banquets would have lacked a large part of their charm. First, of the Californians who joined us en route, and made us happy in the daily curriculum. Among these one of the foremost places belongs to Mr. A. T. Hatch, of Suisun, President of the California Board of Trade, and to Mr. J. M. Davies, of San Francisco, Secretary of the same board. Several of the distinguished gentlemen under whose direction we enjoyed the advantages of local excursions in fifteen or twenty places of interest, have already been mentioned. To these must here be added Mr. N. Cadwallader, of San José; Hon. M. M. Estee, of Napa, whose conspicuous abilities have made him one of the foremost citizens of the State; A. A. Hibbard, of Chico; Mr. George T. Myers and wife and daughter Fannie, of Portland; Professor and Mrs. J. D. Smith, of Livermore College; Mr. L. M. Holt, President of the Board of Trade of Riverside; Mr. H. J. Rudisill, a leading orange-grower; Mr. J. Vandegrift and Mr. C. W. Filkins, of Riverside; Dr. O. P. S. Plummer and Mr. Thomas Paulsen, of Oregon; Mr. Geo. P. Peffer, of Wisconsin; Mr. I. N. Stone and wife, Mr. Henry Avery, of Iowa; Hon. Nelson Bogue, President of the New York Board of Benevolent Institutions; Dr. C. J. Holmgren, of New York; Mr. Geo. D. Hewson and wife, of Nova Scotia; Mr. C. Van Zandt and wife, of New York; Mr. S. Bernard and Miss Dolly Gilman, of Nebraska; Mr. A. B. Matthews, of Kansas City; Mr. J. B. Durand, Mr. H. B. Francis and Mrs. Wade Burden, of Missouri; Mr. and Mrs. J. T. Grimes and daughters, of Minnesota; Mr. C. Harrington and wife, Mr. C. M. Sheffer, Mr. M. E. Sweet and wife, Mr. Charles A. Townsend and wife, of Ohio; Mr. F. C. Johnson and Mr. D. B. Weir and daughter, of Illinois; Captain W. J. Maltby and Nat. Stevens, of Texas; Professor J. G. Lemmon and wife and Professor Abbott Kinney, of California; and especially, Professor and Mrs. H. E. Van Deman, of Washington, D. C.

In the interim between our sessions we have full opportunity to wander about the little city of Riverside, and inspect her places of interest and promise. Of course, we make our way, at the earliest opportunity, to the hall of the citrus fair. We are already prepared by our experience at San José to expect much of the exhibit which the rival city of the south has prepared for our inspection. I am here on delicate ground. The comparative method is the one great method of reaching scientific truth; but in matters of social and civic emulation comparison is generally offensive to the comparees and fatal to the comparer. Nevertheless, the thing must be done in the cause of truth—done judicially and with an impartial hand. The San Joséans had the advantage of a larger and more commodious hall for their exposition. They also drew from larger districts of country than have the people of Riverside. Moreover, the San José exposition was more extensive in the variety of things exhibited. It was primarily a citrus fair; but the exhibit of oranges, lemons, limes, etc., was flanked on every hand by other fruits and nuts and products of the garden and field, *ad infinitum*. The managers at

Riverside have chosen to make their fair more specifically an exhibit of the citrus fruits. It is here that the Riverside region stakes her all. She wagers all her real estate, her bank account, her household and kitchen furniture and her wearing apparel on the proposition that her citrus belt surpasses everything on the Pacific slope; and, if you tease her, she will bet you the same array of valuables that it surpasses any other slope on the hill-sides or in the bottoms of the world. I say, then, with some hesitation, that the San Joséans beat the Riverside exhibit in variety and extent, and that the Riverside exposition was distinctly and unequivocally superior in the specialty of citrus fruits. It is not meant by this that the exhibit of the latter was weak in the show of other fruits and products; on the contrary, it was in every respect a magnificent display, worthy of the most favored and fertile regions; but my judgment is that the extent and variety of non-citrus fruits and vegetables at San José surpassed, by a considerable measure, the corresponding features in the fair at Riverside. In oranges and lemons, however, the southern show is entitled, according to the judgment of one committeeman, to a gold medal bearing on its obverse side a Washington Navel orange tree, and for its reverse inscription, *Primus inter Pares.*

The arrangement of the exhibit in the hall at Riverside was equally meritorious with that at San José In one or two points it was especially artistic. I noticed a grotto constructed of Mandarin oranges, and a solid pyramid of the Washington Navel which might well elicit applause from any judges, however, critical. There was, also, an orange pagoda, built up in complete imitation of an oriental structure, that might have evoked the enthusiasm of all China. The distribution of the fruits showed excellent taste, even to the details of every table. The evergreen decorations were as elegant as those of the rival display by the San Joséans. The exhibit excited great local interest; and large numbers of visitors from the surrounding valley and neighboring towns thronged the hall during the whole time of our stay in the city.

Riverside is, undoubtedly, one of the most booming of the smaller cities of California. The discovery of the fact of the prominence of this region in the production of oranges has brought hither a large amount of capital and enterprise. Rapid development has followed. The men out yonder in those orange orchards mean business. It is not merely an æsthetic affair to plant and develop these dark green trees. Money value and profit are at the bottom of it; the land capable of bearing such orchards is, out of the necessity of the thing, of very great value. The yield per acre from a first-class orange orchard runs up well toward a thousand dollars. It is no exaggeration to say that, with good trees and good cultivation and good care of the fruit, half the above sum may be expected as an annual yield. It is a big thing to have such an orchard, especially when it covers many acres of ground. The Riverside valley is not very extensive. I wish it were larger. From the best information, I estimate that twenty thousand acres, hereabouts, will embrace the better part of the Riverside citrus belt, and I think that five or

six thousand acres of the region are already developed or developing. The population of the city may reach six thousand; but the people believe in sixty thousand, and are preparing to receive them. Yonder, on the west side of the valley, and almost half way up the mountain slope, on a plateau which nature must have designed for the purpose, are already laid the foundations of what is to be the great Robidou Hotel. I climbed up to where the construction is going on, and obtained through my glass a general view of the whole valley. It is one of the most beautiful places to be found anywhere; and the evidences of this sea of green trees in midwinter are better than an affidavit as a proof of prosperity.

The sessions of our Society extended through the 7th, 8th and 9th of February. On the evening of the first day a formal reception was given to the Society at the Congregational church. The welcome address on behalf of the citizens was delivered by Rev. G. H. Deere, and the response on behalf of the Society by President Parker Earle.* In the forenoon of the second day came the local excursion, one of the very finest which we enjoyed in California. Carriages called for the members of the Society at their hotels and private lodgings, and we were away. Among the many scenes of pleasant association and beautiful prospect which arise in my memory from the landscapes of California, I recall with peculiar delight the beauties and pleasures of Magnolia avenue. In the outlying towns of the state I saw nothing to equal this drive. The avenue is a magnificent boulevard stretching out in a southwesterly direction from the city, almost in a straight line, to the distance of seven miles. It is about 120 feet in width. Through its whole extent it bears four rows of ornamental trees—two in the middle of the avenue and one on either side. The center rows are generally eucalyptus, and those on the border pepper trees and palms. This delightful thoroughfare was called Magnolia avenue from the design to border it throughout with magnolias *grandiflora;* but it was found experimentally that the magnolia does not flourish here, not, indeed, from cold and frost, but from lack of sufficient humidity of atmosphere. The magnolia requires an air more given to dripping than can be found in the California valleys. So the eucalyptus, the pepper tree, the palm and the gravellia were substituted; and I, for one, am satisfied with the substitution, especially as it relates to the palm. These, to right and left, are still young and flourishing; but you can see in each vigorous stem and outbranching of glorious leaves the prophecy of the hereafter.

It was along yonder borders of Magnolia avenue that we saw the finest orange orchards to be found in California. Into some of these we turned, and drove among the trees bending with the burden of ripe fruit. It is, indeed, a spectacle, this vast area of dark-green leaves interspersed with globes of gold. Such is the abundance of the fruit in these vast orchards that I am confident, could the beholder look down upon them from a distant height, they would present a tinge of rich yellow like a phosphorescence on the sea.

*See proceedings of the Society for these excellent addresses.

Here it is that the marvelous Washington Navel orange ripens in full perfection. As I have already said, in speaking of the visit of the Riverside committee to us at Indio, on our first entering the State, the Washington Navels are well-nigh as large as cocoa-nuts. They are as large as cocoa-nuts of the smaller size. They are almost without seed, either in the great globe of the fruit itself or in the protuberance at the blossom end, which has given them their name. And the meat is most delicious, totally unlike the contents of those cotton-batting and vinegar products which we see, and sometimes taste, from the eastern fruit-stands.

I am not a connoisseur in the matter of oranges. I know that the Florida oranges are excellent for their fine flavor and sweetness. Among the very best which I tasted on our journey to the West and through some thousands of miles of travel along the Pacific coast were the Sonora oranges, which were sold to me in Paso del Norte, at the entrance to that place where the Tor-r-ro comedy was enacted. I think that by far the best oranges which I sampled in California were the Riverside Navels above mentioned. After these I liked the flavor of the Mandarins, the Tangerins and the Maltese Bloods. Indeed, almost all the improved varieties were fine. And I repeat that those alleged oranges which we buy in our eastern markets are no oranges at all in comparison with the real article, as it is found in the orchard where it grows.

I will avail myself of this connection to say that, notwithstanding the vast improvements which the Californians are making in their orange orchards, by grafting the native stocks with better fruits, there still remains a large excess of seedlings. In many places I saw orange trees that were very unprofitably engaged in delivering to the public such specimens of fruit as ought to have sunk them into the earth; but I also noticed that such trees were generally in neglected situations, and older in growth than those of the improved and cultivated orchards. I beseech you, O Californians, to make haste with this business, and eradicate all your dwarfed and gnarled seedlings from the face of the ground wherever they still remain. They cumber it with a disgraceful mockery of fruit quite disparaging alike to your country and yourselves.

There was a kind of heart-ache among the members of our Society as our last session at Riverside drew to a close. All foresaw that after the evening of the 9th our large company of people, recently, but most favorably, acquainted with each other, must disperse, first into smaller companies, then into groups of two or three, and finally dwindle to one. Man, at the last, makes all of his exits alone. A great excursion is like the fool's description of Broadway, who, when asked what was the terminus of that mighty thoroughfare, replied that it split into two streets at the park, divided into wagon roads in the country, and finally dwindled to a squirrel path and ran up a tree. An excursion is all frazzled at the after end. It has what the anatomists call a fimbriated extremity, and at the tip end of each filament hangs some poor human heart, sorrowfully seeking its home.

But I was saying that the break-up was by no means agreeable to us. We had been together much longer than it requires to cross the ocean, at least that little ocean called the Atlantic. We had formed such ties as people do a-shipboard, and they did not break without a pang. Strange is that necessity which drives us ever onward—strange are the forces blowing up from the unseen world, driving us first into association and then asunder. All the animals except man may be classified according to a certain predominating disposition to live together in groups or live singly. Of the former sort, sheep among the quadrupeds, and pigeons among the birds, furnish the best examples; and of the latter, our brother bear is the antitype of all. For downright solitude and selfishness, for compact enjoyment of his own company and cynical disregard of all other living things, including his own wife and children, the American brown bear stands preeminent over all the creatures that walk or crawl or sprawl. But man is neither the one nor the other. He is neither gregarious nor non-gregarious. Sometimes he swarms, and sometimes he hibernates by himself. Hence, our tribe has two great fields of activity, society and solitude. These reflections, however, obstruct the narrative; and I hasten to say that our formal work was completed on the evening of the 9th of February, and an adjournment without day ended our union as a body.

Meanwhile, however, several invitations had come in to visit other cities in Southern California. The principal of these was the call to make an excursion to San Diego, and this was formally accepted. A large number of our friends gathered at the station on the following morning, and were away to the southwest angle of the State. It is a hundred and twenty miles, and requires a larger part of the day. Arriving at Colton, we take a taste of riding on the Atchison, Topeka & Santa Fe. As we turn to the south, and the Riverside valley drops behind us, we enter a country somewhat different from any which we have hitherto traversed. The mountain ranges in this part of California sink to a lower level. They are now only the spurs of the Coast Range, trending out here and there toward the Pacific. I noticed another feature different quite from the aspect of any of the northern valleys. The lowlands of the country, as you approach San Diego, grow green with pastures; and, though the scene has not a familiar aspect, there is something analogous in it to what one might see in Pennsylvania or Kentucky. Occasionally the train passes between rounded heights that rise on either side and are green to the summit. Here again, as in the Sonoma valley, I noticed small herds of cattle of good breeds helping themselves to rich pasturage. There is, also, a more plentiful distribution of water on the surface—a running stream here and there, or a pond that a Californian might dignify by the name of lake. In these low parts there is everywhere an abundance of water-fowl. As the train passes they skim out on the surface at a right angle and leave an agitation on the water like a rippling harrow drawn by the bird. We shoot at them now and then, a sport which is doubtless more amusing to the ducks than to ourselves.

It is well towards night-fall when our train approaches San Diego. There is a little flurry of preparation, a little excitement for a view of the ocean on our right, and here we are. The greater number are expected at the Hotel St. James; but a few of us take the ferry, cross the bay, and make with all speed for the famous Del Coronado. Time is not for anything, to night, except to provide for the morrow's comfort and pleasure.

Those of us who crossed the harbor to spend the night on the Coronado beach were astonished, on entering our rooms at the hotel, to hear a sort of thunder and roar as if a battle and rain-storm had combined their energies outside. Up with the window, and here it is. The Pacific lies below, tumbling and roaring against the very battlements of the hotel. All night long the sublime symphony goes on and on, as it has done for infinite ages—even before the epoch of man. Welcome to its roar! Welcome to its majestic thunder, its rhythm of the surf and its perpetual beating on the shore! It was the throb of the sunny sea, the *polyphloisboia Thalassa* of Homer on the sands of the Ægean Islands, and around the coasts of the ancient Peloponnesus that put into the ears and spirits of the Hellenic bards of old time the pulse-beat and music of their sounding hexameters.

With the morning light we are all astir, on both sides of the bay, to see what things soever San Diego has to offer. The writer, in early morning, took the street-cars and ascended to the highland north of the city, from which a fine view can be had of all below. The car that carried him up to the summit was propelled by electricity. Even so it is that we have lived so long, and journeyed from the older States of the Union, deep-rooted by time and development, and boasting much of the accumulation of the progressive forces of society, to this far southwest and extreme verge of our country, to what was an old Spanish town, to take our first ride in an electric car. Perhaps, after a while, the street-cars in Boston will be propelled in like manner; but not yet. Albeit, if San Diego had *remained* a Spanish-Mexican town, a century would not have brought the electric railway to her streets. It is the tumbling surf of American life that flings such things into the thoroughfares and plazas of old towns.

San Diego is a living competitor with her fellow cities of the California valleys for the prizes of the future. I had expected, however, to see a better equipoise to Los Angeles in population and enterprise than San Diego is able to present. The Queen of the Angels has fully three times as many people, according to my estimate, and the southern city will have to travel far before she comes up with her rival. Nevertheless, many things may be truthfully said of the vigor recently displayed in the development of the city of the south, and to the efforts which her citizens are putting forth to raise her rank and influence must be added the ever-memorable fact of her magnificent harbor. I have already remarked upon the scarcity of havens along the Pacific coast, and have said something as to the relative merits of the bay of San Diego and that of San Francisco. I repeat that the former is, for its extent, as fine and safe a sheet of water as may be found on the shore of

any ocean. While we were in the city one of the government iron-clads came to anchor at the pier, and the heaviest ship on any sea might do the same. Besides, the bay, though not of the largest dimensions, is sufficiently capacious. If Los Angeles should be arrogant in her boasting, San Diego may well respond by showing a map of her splendid harbor.

The first local excursion of our company was across the bay to the Hotel Del Coronado and along the beach beyond. Only a few years ago this Coronado beach was merely a long, low plain of sand. Nothing could be less promising in its natural aspect than was the desert beach. But the shrewd eye of enterprise saw the possibilities of the situation; the peninsula is already reclaimed; palm trees are here; a park is there; flowers are blooming in the new-made lawns; and yonder rises one of the finest hotels in America. It is not yet completed at the time of our visit, but is sufficiently advanced to receive some hundred or two of guests. The structure is of wood. The building is a great quadrangle, including, within, the largest hotel court between the Atlantic and the Pacific. The court is a sward crossed with stone walks and having a fine fountain in the center. The most fragrant flowers and beautiful shrubs are planted here and there; and the air brings to the senses of the guest the sweet perfume of early or perennial blossoms. The marvels of the hotel are this magnificent court, the ample theater in one part of the structure and the beautiful dining-hall, not yet built. The latter will be one of the most elegant in the country. It is to be a parabola in shape and finished throughout in redwood; whether of the *Sequoia sempervirens* or of cedar, I am not certain. The Hotel Del Coronado as a whole is worthy to take equal rank with two others in California—the Del Monte, of Monterey, and the Raymond, of Pasadena. These three constitute a group by themselves; and above them is seen only the Palace, of San Francisco.

A walk of a few minutes from the north steps of the Del Coronado brings us to an ostrich farm. Why the word farm is applied to it, I hardly know. It has a comparatively small area of ground, perhaps an acre. It is bounded with a close fence, high enough to prevent the escape of the ostriches. Of these there are thirteen, in a sort of corral, inside the inclosure. Their two-pronged, grotesque feet have beaten every sign of vegetation from the arena; and they have the pleasure of sauntering about over the sand as in their native desert. Some of these solemn creatures are black as to their wing feathers and tail, others a kind of saffron color; and both varied with patches of white. Some parts of their bodies present only a surface of wrinkled skin. The beak is rather useful than aggressive in its construction; and the eye is the most strangely introspective organ that I ever saw in bird or beast. It suggests to you that the possessor has been studying into the mysteries of Buddhism, and expects, in due course of time, to enter into Nirvana.

A male ostrich of good development can reach over a large horse and get an orange out of the stirrup on the other side. Having done so, he swal-

lows it whole; and you can see the globe majestically and slowly descending the gullet. Doubtless the ostrich has a longer taste than that of any other living creature, except the giraffe. He will swallow five or six such things as oranges one after another, and you can see the protruding knots in his long and twisted esophagus as they gradually work their way down stairs. He could perform several curves of a minuet before the last disappears from sight.

What is an ostrich farm for? It is for the production of ostriches. And what are the ostriches for? They are for the production of feathers, and the feathers are for sale. Your vigorous, well-grown ostrich may be plucked every six months, and the less thrifty birds every eight or nine months. The yield of feathers from each is from one to one and a half pounds, and the farmer receives for his product from forty to sixty dollars a pound. An extra bird sometimes yields a hundred dollars' worth of feathers at a time. When the plucking season arrives, the birds are harnessed up in a narrow stall and carefully blindfolded, for fear the officiating clergyman may be kicked through the fence. The ostrich becomes exceedingly angry with the pulling of his feathers, and his kick is one of the most swift and dangerous reactions ever excited among the muscles and tendons of animated nature. When the bird is angry he lifts his wings, throws forward his head somewhat, and utters a sort of hiss, which he bites off with a snap of his bill. About this time look out for action.

After our visit to the ostrich farm we made our way down to the beach and spent some hours on the shore of the Pacific. Here, for the first time in my life, I had an opportunity to study and compare this majestic water with the other seas and oceans. One might well suppose that an ocean is an ocean without its characteristic features; that one is as the other; but not so. The ocean is glorious in its individuality as in its strength and grandeur. In the first place, the shore has an ever-varying condition. The Pacific coast is totally different from that of the Atlantic, in that it is almost everywhere precipitous, broken off square down to the deep. Sometimes the precipice is hundreds of feet in height. Sometimes the square wall, which is the *thus far* of the surf, is long and low; but rarely do we have the gentle, sloping, shingly beach peculiar to the Atlantic shores. If you stand upon the precipice of the Pacific and look down to the surf you shall find almost everywhere a quarter or a half mile of shingle, which is the debatable ground, alternately covered and uncovered by the tide. At high tide the ocean roars against the foot of the precipice, and no beach is seen; but at low tide the surf line is out at a considerable distance, and thousands of people may gather down there on the strand between the ocean wall and the break of the sea. Such is the general aspect of all those parts of the Pacific coast which I have visited. The next fact is that of the greater grandeur of the Pacific as to the visual expanse, the length and height of the billows, and the majesty of the ocean symphony. I do not know how it is that the Pacific can suggest its extent and almightiness to the beholder

on the shore. It may be his own knowledge that infinity is before him; but the scene does inform him, in some way, that the infinite is there. The incoming billows, even when the sea is most calm, are, according to my estimates, from ten to twenty feet in perpendicular height. Each wave stretches laterally for miles and miles. The ocean rhythm has its mathematical and musical succession. It has its mighty poetical feet. It has an anapest or a dactyl, an amphibrach or a molossus, according to the mood of the spirit that broods upon the waters.

> "Break, break, break,
> At the foot of thy crags, O sea;
> But the tender grace of the day that is dead
> Will never come back to me."

After delighting ourselves for a while with a free stroll up and down the beach (for the tide was out), we returned across the bay to San Diego, and were favored by the citizens with an excursion through the country. The region round about the city has the same general aspect as that described above, on our approach from the north. It is a fruitful region. Some of the oldest vineyards and olive orchards in California are found here, and vines are known which were certainly planted by the padres well back in the last century. Out yonder, at the distance of some miles, is the old adobe mission, which was, doubtless, the nucleus of Spanish civilization in this district. I have never seen a structure which is more difficult to describe than the ruins of one of these ancient mission houses. As you approach across the plain you see in the distance what might be mistaken for the outlines of an abandoned fort. The missions were generally defended by a wall of sun-dried bricks, standing at a distance of ten or twenty rods from the buildings within. The wall is four feet thick at the base, about twelve feet high, sloping to the top. Here and there were openings or sally-ports, which I suppose to have been closed by heavy wooden gates. In the valley of San Fernando I saw some evidences of a kind of portcullis arranged for defense in connection with the wall of the mission. The mission house proper is also adobe, generally two stories in height, and, withal, a rather formidable sort of building. The walls are very thick, the windows and doors small and easily defensible. The roof is constructed of tiles, which must have been burned in a kiln, as they are red. They are of half cylindrical sections, about six inches in diameter and two feet in length. I have no doubt that some of these roofs, undisturbed for a hundred years, still shed the water without a drop of leakage. In many places the mission houses have tumbled down. Sometimes the corner or end of the structure has fallen away and the roof caved in. In hardly any localities do the outer walls stand in even tolerable perfection. They have generally sunk to the earth, and are traceable only by the long mole, or agger, which they have left behind them. In a few places, I believe, the missions are still occupied by a company of priests, but they are only a shadow and memento of their former estate. It was within these structures that the Hispanio-Mexican civilization of the Pacific coast

found its last refuge when Fremont and Stockton and Sloat, with the flag of the United States over their heads, came in, pell-mell, as explorers and conquerors.

On our return to the city of San Diego on this Saturday evening, February 11, what was still worthy to be called our California excursion came to its finale. After that night the break-up was complete. A part of the company remained in the city for some days afterward, but the remainder took to the outgoing trains and made for the north. There were hand-shakings and farewells, and I do not know but that a few tears were dropped here and there on this sandy southwestern shore of the United States. As for myself, I can not take leave of the place without a final stroll *incognito* through the streets. I went into Chinatown, along the shore of the bay, through the streets where citrus fruits are packed and transported, and down the track toward National City, some three miles away. On one of the street corners I was much amused with the antics and foot-races of a half-dozen greyhounds that had their maternal abode in a yard near by. They were by far the handsomest fellows that I ever saw; of a dark mouse-color, trim and fine as to their delicate limbs and head; all chest and spine; agile as gazelles. There are four California animals that compete with each other for the first rank in swiftness of foot and flight. These are the greyhound, the deer-hound, the deer himself, and the Marquis of Leap. It is sometimes a little difficult to determine which of the four is the most expeditious on his goings forth, but on the whole the palm belongs easily to the greyhound. With a space of ten rods between him and the Marquis of Leap he can catch him in three-quarters of a mile—that is, he can run over him, for the Marquis doubles and goes back. In a quarter of a mile the greyhound runs over him again, and on the next turn picks him up. So, likewise, the deer has no escape from his pursuer except by eluding his sight. The nose of the greyhound is an æsthetic organ rather than an instrument of utility. He sees, but smells not. The deer-hound has less speed than his rival, but can overtake his game by scent. As to the Marquis, his great organ is the ear. It is a great auricular trumpet set up to gather all sounds of danger, and to indicate the direction of approach.

On our leaving Riverside a considerable number of our company remained at that place, and, presently, crossed the country by way of Colton, on a visit to San Bernardino. Before leaving our homes a formal invitation had been extended to the Secretary of the Society, and the invitation was repeated before the adjournment at Riverside, to visit San Bernardino, and the call was now accepted. Straggling members from San Diego joined the party en route, and the San Bernardino excursion proved to be one of great interest and profit. The young city to which the company turned its course lies but a short distance to the east of the line of the Southern Pacific Railway, and immediately on the line of the Santa Fé Railroad. Colton is the nearest station on the former road. The town is situated in the upper part of the Santa Ana valley, and the region is one of the most productive and

beautiful of its kind in the State. This should be said for the people of San Bernardino: that nowhere on our journey was greater hospitality shown us than by them. Provisions had been made for our reception and entertainment. The headquarters of the Society were at the elegant new Stewart Hotel, where a retinue of carriages was in waiting for the drive among the orchards, vineyards and gardens of the valley. The writer has availed himself of the eyes—the observant eyes—of our Secretary to obtain a glimpse of the circumjacent country and its products. One circumstance, at this stage, should be mentioned as detracting from the pleasure of the broken excursions which remained for the various squads of our members who still held together. President Earle and Vice-President Munson had already set out on their journey homeward, and their absence was regretted by all. But under the lead of Major Evans the party at San Bernardino still rejoiced with the spirit and panorama which had become habitual. Certain it is that of the many entertainments given to the Society in California that at San Bernardino was among the best. The local excursion carried the visitors to Lugonia and the Terrace villa hotel. Here a banquet had been spread, at which our companions regaled themselves for the remainder of their journey. They then passed, by way of Terracina, to the Barton villa and the old Spanish mission. The morning was beautiful, and from the Prospect House a splendid view was obtained of the valley below. The scenery here is romantic. On the one side rises the sublime form of old San Bernardino, and on the other spreads away to the southwest the valley which has taken its name from the sparkling Santa Ana. On returning to the Stewart the fragments of our company, some twenty or thirty in number, held their last formal meeting, and passed their last resolutions of respect to the cities and citizens whose bounty we had so greatly enjoyed. Before leaving San Bernardino, a beautiful souvenir in the shape of a gold bronze token of the Board of Trade of the city was bestowed on each of the guests. San Bernardino has a population of about six thousand. She is ambitious of a first rank among the competing communities of the Golden State. On the obverse of the little token which she gave to our company was this confident line:

"We take jurisdiction of every enterprise." May all your ambitions be gratified, O handsome city of the Upper Santa Ana!

CHAPTER VIII.

BACKWARDS MARCH.

The Final Break-up.—Reluctance to Go.—Chinese New-Year in Los Angeles.—Fire-crackers ad libitum.—The Old Bad One and Red Paper.—Enterprises of The Angels.—The University of Southern California.—San Fernando: Her Water Supply.—A Dry Mill-pond.—The Santa Barbarians.—The Mojave Desert Again.—The Mirage in Death Valley.—The Yucca Palm.—An Old Sleeper.—Scenes About Mojave.—A Mountain Cloud-burst and its Consequences.—Once More at San Francisco.—Heaping up of Radicalism on the Coast.—General Sketch of the City.—Sand-Hills and Dune Grass.—The Park and Conservatory.—Harbor and Military Stations.—Vessels at Anchor.—California Wind.—Shops and Marts.—Manners and Morals of the City.—San Franciscan Methods and Enterprises.—Big Men.—Leland Stanford.—Old Jimmy Lick.—Visit to John at Home.—His Place and Style.—His Restaurant and Joss-House.—Mumbo Jumbo.—The Chinese Situation.—Out-of-Door Life in San Francisco.—Gathering of Bric-a-Brac.—Departure.—At Sacramento.—Climbing the Sierras.—Mining Camps and Mountaineers.—Salt Lake City.—Aspect of the Valley.—Water Supply.—Z. C. M. I.—Smith and Polly.—Essentials of the Mormon Question.—Among the Saints.—The Temple and the Tabernacle.—Tendency of Latter Day Sainthood.—Again En Route.—Some Personalities.—Entrance of the Gunnison.—Ascent of the Cañon.—Impressions.—Castle Gate.—Marshall's Pass.—Among the Snow Peaks.—Beginning the Descent.—Black Cañon and Royal Gorge.—The Arkansas Cañon.—Pueblo.—Onward to Colorado Springs.—Manitou and the Garden of the Gods.—To Denver.—Characteristics of the City.—Speech making.—The Argo and Grant Smelting Works.—New Process of Separating Metals.—Scenes and Sketches.—Institutions.—The Denver Climate and Lung Diseases.—Fur Goods and Mineral Bric-a-Brac.—Bancroft Ranch.—A Colorado Sunset.—Homeward Bound.—Kansas City and Farewell.

Returning from the San Bernardino excursion, those of our company who still hung together in clusters of three or four made their way, some to Los Angeles and the north, while others tarried until the Santa Fe and Southern Pacific trains came by to take them up for the homeward journey. One considerable band, ambitious of having a last view (and perhaps a last banquet), wandered off to Santa Barbara, on the coast. But the excursion as such, was now hopelessly broken up, and after this day we saw each other only by accident. For some weeks, here and there in the California towns, we occasionally met each other by twos or threes on the streets; but our great voyage was at an end. It, therefore, only remains for the writer to summarize as much as he may of the return across the mountains. In doing so he must, of course, speak almost exclusively of his own experience en route over the Central Pacific and the Denver & Rio Grande.

The traveler about to return from a tour in California will find many things to hold him back. He feels a good deal like those little figures of men and animals with iron feet which I have sometimes seen standing immovable on different parts of a magnetic globe. You can slip them, but hardly pick them up. So your traveler in this country, yearning to be at home again, still finds some object to detain him. Like Goldsmith's pilgrim in the Europe of a hundred years ago—

"He drags at each remove a lengthening chain."

The best proof, which I had for myself, of the general merits of California was my reluctence at the last to leave its scenes and places. I found that, half unconsciously to myself, a vast and interesting panorama had passed before me, and that unexpected associations of interest had sprung up here and there which, I confess, it cost me a pang to break.

In the first place, the writer tarried for three or four days in Los Angeles. Here he extended and rectified his impressions of the city, which have already been given in a former chapter. An incident of this our third visit to the Queen of the Angels may be of interest. It was the Chinese New-Year, and all Chinatown was in a state of jubilation. Every mother's son was clad in his best, and taking a holiday. Chinese headquarters in Los Angeles are on the southeast corner of the plaza. It is a kind of hotel and joss-house combined. Other local centers here and there gave token of their existence by minor volcanoes of noise; but the great eruption was on the plaza. Here, on my arrival, in the middle of the afternoon, some ten or fifteen thousand people were gathered to witness the display from the balconies of the alleged hotel where John was doing his work. Gay banners were hung out over the balustrade and from the eaves of the house; but the principal fact was the explosion of fire-crackers and torpedoes. I am sure that in the course of the hour which I wasted in this crowd there were more fire-crackers annihilated than I ever saw before in my life. The Chinese arrange these little diabolical explosives in a great cable, the fuse of each cracker running into the center. The cable itself, which is several rods in length, has a fuse in its center, from end to end, so that when the great fuse is fired the infinity of smaller fuses are ignited, and every individual cracker and torpedo goes off *ad libitum.* Four or five of these cables were hanging out from the balcony when I arrived on the grounds, and all were in a state of active eruption at once. It was a din to wake the dead. It will convey some idea of the extent of these explosions when I say that the whole street running along the south side of the plaza was almost shoe-mouth deep with the litter of the combustion.

Why is a fire-cracker red, anyhow? For this good reason: The Old Bad One, according to the Chinese theology, is always greatly interested with anything that is red. He never passes a red object without stopping to examine it. No bit of red paper is ever omitted from his scrutiny. The Chinese theory is that by a plentiful distribution of red things up and down the pathways of this world the operations of his majesty are retarded. His

attention is distracted from more important work by every red trifle which he finds in the road. For this reason, at a Chinese funeral, the route from the house to the depository of the dead is always strewn by the mourners and their friends with bits of red paper, so that if the devil should come that way hunting for a victim his faculties will be occupied with the red paper until the burial is safely over. There are many citizens in our own dear country to whom I recommend the same admirable expedient as a protection against the legitimate consequences of death.

I spent the following three or four days in looking about Los Angeles, and especially in gathering some information about the University of Southern California. President M. M. Bovard made the writer his guest, and furnished every opportunity to visit the institution, note its workings, and estimate its prospects. The Californians are wide awake on the question of education. Institutions of the higher grade are springing up everywhere, in attestation of the spirit of the people. The university recently founded by Hon. Leland Stanford has already been mentioned. Our visit to the State University at Berkeley came in for its share of notice in a former chapter. I neglected to say that the University of the Pacific, at Santa Clara, is also in a state of prosperity and rapid development, and that the State Normal School at San José is a highly reputable institution. This University of Southern California, at Los Angeles, is already strong in condition and prospects, and especially so in the matter of endowment. I believe that a fair estimate of its resources will at the present time reach $2,500,000. And yet less than eight years ago President Bovard himself, with a single companion and a spade, turned up the first shovelful of earth for the first insignificant building of the institution.

I have already spoken about our passage through the valley of San Fernando. On my third journey through these parts I had the pleasure of stopping at the little town which has taken its name from the valley, and of inspecting the country. It has the same general character of many of the lowland districts already described. It is a very arid region, the annual rain-fall being almost at a minimum; but I did not visit any region in any part of the State where the means of artificial irrigation are in process of better development.

A description of the method adopted for this purpose will prove of interest. The town of San Fernando is situated about four miles from the base of the mountains, lying transversely across the top of the valley. Beyond, a little to the northeast, is the mouth of one of the principal cañons, opening on one of the lowlands and bringing down from the snows of the summits a stream of water that might be dignified by the name of river. No sooner, however, does this reach the plain than it divides into channels, skims the surface, wanders around over a brief space and sinks out of sight. To economize the water of this stream was the main end proposed by the company having the matter under consideration. And this is the plan adopted: Across the mouth of the cañon, from mountain spur to mountain

spur, a distance of six hundred and eighty feet, a trench about six feet in width was digged down to hard-pan. Hard-pan, in this region, means a kind of tough, putty-like clay which resists the pick and shovel as shoemaker's wax resists a knife. It is totally impervious to water. In the middle of the cañon, where it is crossed by the ditch, the depth to hard-pan is about fifty feet. On either hand, toward the mountain spurs, the depth is less and less up to the surface at each end. In this deep trench a stone wall laid in hydraulic cement is reared to the surface, and above the stone wall, in what may be called *a dry mill-pond*, are digged two enormous wells. They reminded me of that tremendous reservoir shown us in the Blowers estate at Woodland. Into these wells are dropped two twenty-inch pipes, and great pumps are attached capable of lifting eighteen million gallons of water per day. The water is thus carried from the bottom over the wall and is distributed by conduits to the plain below. The land owned by the company covers an area of twenty thousand acres. It is divided into lots of forty acres each. On two sides of each lot are laid six-inch pipes full of water from the works. From these pipes smaller lines are extended across the land until all is supplied. The company guarantees the purchaser to furnish to each acre a maximum of fifty-four thousand gallons of water per day. This enterprise is a specimen of the work which the Californians in many parts of this State are doing in the way of making up for the disadvantages under which they are placed by nature. After all, I do not know that the irregular and frequently deluge-like rain-storms, which pour out their floods in unseasonable seasons upon the fields and pastures and orchards in the States east of the Mississippi, are an unmixed blessing. Perhaps, if man could manage the whole business himself he would satisfy himself better in the distribution of his water supply, and especially of his showers.

Before we begin our ascent of the mountain range which divides us from Antelope valley and the Mojave desert, it only remains to refer to that part of our company who, on the return from the south, made their way down to Santa Barbara. They came back from that excursion with not a little praise on their tongues as to what they had seen and enjoyed at the ocean side. I gathered from authentic sources that two facts belonging to the Santa Barbarians were worthy of special note. The first is of much interest to horticulturists. I think it is conceded that Santa Barbara has a climate more nearly tropical than that of any other town in the State. She can produce bananas and similar varieties of fruit with very little apprehension of injury from frost. At the Riverside exposition some fine products of this kind were shown in perfection; and they were from the low, warm country about Santa Barbara. The other fact is the circumstance that this city is the residence of Hon. Ellwood Cooper, president of the California State Board of Horticulture. Mr. Cooper had been from the start one of the most active promoters of the enterprise which resulted in our going to California and holding our sessions at San José and Riverside. His reputation

in the Golden State is of the best, and it was a matter of universal regret to the Society that circumstances prevented his presence with us at our general sessions.

What I was about to say was that the Santa Barbara excursionists returned to the Southern Pacific trains and there broke up, some going south, and others north, by way of San Francisco, on their return to their homes beyond the mountains. The writer belonged to the north-bound band, and we now make our way over the lower branch of the Coast Range into the Mojave desert, and take our course for the metropolis.

I have already spoken more than once of the character and appearance of this low, waste region between the mountains. Here for the first time I saw the veritable mirage. I do not believe that the science of physics has yet explained this strange phenomenon. Looking off yonder to the east and south of Death Valley, there is a landscape of water and palm trees and villages. The vision is a little spectral in its outline, but all plain enough, and you would like to be there on the border of the lake. But the vision drifts from you, and takes another form. I must try my hand at a little poem on

THE MIRAGE IN DEATH VALLEY.

I.

O lake that sleepest on the glimmering plain!
  O nodding palms in the horizon dim!
O tents that vanish and return again!
  O shining spires above the desert's rim!

II.

How do ye gleam and fluctuate and float,
  And yet hang motionless! No life is seen.
There stands the castle o'er the drawbridge moat,
  But prince or princess there is none, I ween.

III.

There shining villages lie slumbering!
  Over the walls a spectral donjon towers,
But casts no shadow! There the fountains fling
  Their pictured waters on the pictured flowers.

IV.

No whirring wing, no bounding foot, goes by,
  No wild fowl ruffles that mock-water lake;
No tall reed quivers with a song or cry;
  No girl or fawn stoops down her thirst to slake.

V.

Over the glistering desert swims and drifts
  Yon town of Tantalus, with silent gates—
An air-built image that recedes and shifts
  Across Mojave where Death Valley waits!

I make a note of one other thing as I traverse this region going north. It is that ghost of the desert called the Yucca palm. As a specter it may be said to rival the giant cactus. The Yucca palm is the indescribable. It rises from the sand like a round post, with a rough, chaparral-like gray-green bark curling out upward from the stem. A squirrel might run up to the fork easily enough, but would have trouble in coming down. The trunk branches at the height of from eight to twelve feet, and puts out weird, long arms, which look as though they had been straight at first, but several times broken and re-set by Mrs. Apache Squaw, M. D. At the end of these contorted elbows appear stunted bunches of pseudo-tropical leaves, and that is your Yucca palm, your ghost of the Mojave desert.

It is a long ride from Los Angeles to San Francisco, especially when your sleeper is the old "Peoria." This vehicle of human transportation was built by the Pullmans in 1867, and is, I believe, a venerable relic of the first year of their manufacture. I could but reflect, as I inspected the narrow and incommodious apartments of this primitive sleeping-coach, how great a transformation has taken place in the apparatus of civilization since the reign of Andrew II. Your colored porter takes his manners and character from the coach which he has in charge, and you take your temper from him.

During the night I have an indistinct consciousness that the train is still. After some turns I awake, expecting to find myself in San Francisco, but on looking out it is only the desert town of Mojave. There has been a cloud-burst in the mountains just ahead, the track has suffered a wash-out, and a ninety-ton freight engine, lying dead, with his nose in the sand, is awaiting the first resurrection.

All day long I wander around the desert. Yonder to the east I see some heavy ox-wagons coming in, laden with borax from the mines in Death Valley. Here I find a miserable tent, inhabited by some Digger Indians—the most squalid human abode I ever saw. The leering, dirty squaw has two daughters, mere animals; the elder about ten, the other may be seven years old. There is a sort of dog-wolf sneaking around the tent, and a magnificent tortoise, about a foot across the back, is drilled through as to a hole in his parti-colored shell, and is tied with a strip of intestine to a stake. Charles Darwin, F. R. S., come and take her away!

After a cloud-burst have a care how you scurry out on this desert, or in you go. Ankle-deep or knee-deep, in you go; but if you will wait till the afternoon you can run everywhere, so quickly does this superficial slush of sandy water go down forever. It did not rain much here at Mojave last night, but six or eight miles up yon cañon there was a water-spout that would have drowned Deucalion. Out of that cañon comes a river. It is a yellow, plunging flood of turbulent waters, headlong, desperate, broad and deep. But at the mouth of the gorge, where the angry deluge issues on the plain, the roaring river suddenly spreads out flat, and then flatter. It finds many shallow channels, and makes others for itself. For a certain distance

out into the desert it rushes and roars along, then skims the surface a few inches in depth, and then dives into the sand-beds. If the sand could be scooped out of this so-called desert there would remain a salt lake, intolerable to all forms of life. If the water could be pumped up from the basin and distributed on the surface, there would spread over this plain a veritable garden of God. But the sand is here, and the water is down there, and so the Mojave hangs suspended midway between the Dead Sea and Paradise.

During my stay beyond the mountains I had it ever in my mind to pause for a considerable season in San Francisco. I wished to study this extreme aspect of American life, and to test, by personal experiences, its rhythm and timbre. I can but regard this far verge of the United States with the deepest interest. I can easily perceive that on this edge of the Pacific there is an accumulation and massing of forces the like of which has never been seen otherwhere on our planet. The radicalism of mankind has for many centuries taken a westward flow. That aggressive part of our race which always feels the draught has followed the sun in his course, until at last it has heaped up on the precipitous edge of this infinite water. The cumulative tendency of these powerful human elements is, I believe, as strong as ever. The influence which has carried the most active and adventurous of mankind to the west is a cosmic force, and can no more be stayed than the mighty tides that throb along the surface of the sea.

Great, therefore, is the intensity of human life in San Francisco. But I was about to say that my expectations of an extended acquaintance with the civic manners and the social and moral geography of the Pacific metropolis were disappointed. Many circumstances had supervened to cut short my intended expeditions, incognito, around the ways and by-ways of Yerba Buena. But I saw something of the city, and remember something of what I saw.

San Francisco is pleasing to the vision. It is built on ridges and high grounds at the northeastern extremity of the peninsula. It is a picturesque city, especially as viewed from the bay or the opposite mainland. These elevations, on which the principal parts of the metropolis are aggregated, are, or were, the celebrated sand-hills, and these you may still see in their unmodified condition between Golden Gate Park and the sea. They are mere ridges of loose sand, of a yellowish color, drifting and whirling under the pressure of the wind. In the absence of experience one might take his affidavit that no living thing could exist in these beds of loose, capricious and juiceless sand. You would sooner expect to see violets growing in an ash-heap. Yet there is one form of life which is a match for the sand-hills, and that is the dune grass. Only by courtesy can it be called grass. It is so hard and sharp and bony that a prudent rhinoceros would reflect long before he would attempt to eat it. The roots are as much like whalebone as the blades. Where they go to I do not pretend to say, but I will venture the opinion that each root is fastened on the under side of the peninsula with a screw-tap.

Your dune grass grows in small tufts or bunches. That is its method.

On the side of yon sand-hill the tufts are scattered with perfect regularity. I do not know whether they were planted there or "just growed." But one thing is certain: give this grass a hold and all the apparatus and tackle of nature can not jerk it or shake it loose. Each root is a real-estate pin, and whenever you get it driven you may buy your corner lot with a reasonable certainty that it will stay with you over night. I never could understand how real estate *fluctuates* until I saw the sand-hills back of San Francisco! Golden Gate Park was built or created, or, at least, organized, on these ridges of sand, and the park shows conclusively what the genius of man is able to accomplish when assisted by dune grass and water. Ah, but it is a green and lovely place! And the conservatory! I was never before inside of such an inclosure. Oh, the palms, and the ferns, and the tropical luxuriance! Never before did I breathe an atmosphere so dead-drunken with the fragrant effluvia of exhaling leaves and the drowning perfume of flowers. I thought of Persia, and Ceylon, and the Arabian Nights, and finally of ———. My scholarly friend, Augustus L. Mason, was always by my side in my hurried rambles around San Francisco. By the courtesy of Captain D. D. Wheeler, of General Howard's headquarters, we two were armed with tickets and took to the water—that is, we took to a little government cutter and made the circuit of the bay. Every day at noon this cutter goes the rounds of the military stations about the harbor. They are three or four in number, and are sufficient, I suppose, to give a sort of mythical sanction of force to the doings of civil society. But as an actual protection against, say a fleet of iron-clads, they would not amount to a scarecrow. The first station, which is on the peninsular side of the bay, is a sort of military prison, in which every poor fellow who gets off his base is shut up under penal regulations. A squad of offenders were just being brought in as we passed. They were quite chop-fallen. I noticed one of the prisoners who stepped off the gang-plank under guard still holding to a little bouquet of roses and pinks. The guard knocked it out of his hand, and I saw through the pallor of his forehead these letters, which I could not for a while make out, r-i-a-p-s-e-D.

On the north side of the harbor is another post and drilling station for cadets. The shore-line is very beautiful here, and the mountains make, as everywhere, a fine horizon. The officers of the cutter and they on the land side exchange salutations, and away we go into the city. In one thing I am disappointed. There is not in the harbor nearly so much shipping as I had expected to find. The display was not at all comparable with that to be seen at all times of the year along the wharves and around the lake-shore at Chicago. The few ships anchored here and there are of a highly respectable character—foreign and American vessels of large size, just in from long voyages in Pacific and Australian waters; but the array is insignificant in comparison with the forest of tall masts and black smoke-stacks stretching from Fulton Ferry around to the Battery and along the east bank of North River, at New York.

It appeared to me that the general outside conditions of life in and

about San Francisco were altogether pleasant. I had been told fables about the wind, and had expected to run into bits of gale too strong for tenderness; but the fact differed from the fable. I found the air in California generally astir, and on the immediate bench of the Pacific it might be called windy; but in other situations I do not recall that our pilgrims were ever troubled with too much breeze. When we first traversed the San Gabriel valley there was a wind blowing at Ontario; but in all our journeyings up and down the San Joaquin and Sacramento plains we went unvexed and unblown to our places. I conclude, therefore, that the bad reputation of the California wind clerk is based on slander; and the allegation that he considers it mere pastime to blow the soul out of a hippopotamus is a campaign lie started by the opposition. I candidly declare that I never saw him in any other role than that of a gentleman.

The shops along the principal streets in San Francisco are beautiful and brilliant. There is much variety. The Japanese store near the Palace is perhaps the best in the country. There are many places where you can gather bric-a-brac to the full capacity of your trunks and boxes. Human life in the street flows at a rapid rate. The San Francisco pulse is several strokes to the minute above the average; and the temperature of the biped, especially about the exchanges and real estate offices, is above the normal.

My stay in the city was too brief to furnish the data for a fair generalization on the subject of San Francisco morals. That old pessimist, *They Say*, calls it a bad place, and I should not be surprised if there is much ground for his bad opinion. I think that San Francisco swears and drinks, that she gambols a good deal and gambles some. I think that her society is by no means conservative, as it respects the practice of several of the civic virtues. I think that her human breast contains a good deal of machination and not a little passion. But I have some things to say also in her defense. I believe that her drink is largely wine, and that she consumes less fire-water than any other American city of her size. This, as far as it goes, is good. To be sure, I do not justify wine-bibbing, but I only say that, if the human animal must administer some sort of oblivion to himself, it is better to take it in fermented grape-juice than in the form of hell-fire. Again, as to San Francisco sin, it appeared to me that there was something manly and robust about it which half transfers it to the column on the other side of the ledger. The old Enemy became a snake at the gate of Eden, and goes on his belly to this day. He is a sneak. He slips around into all the coverts of the world, and is constitutionally ashamed of himself. The wickedness of cities is generally of this sneaking variety. It slips around in the dark, and squats, and hides, and lies. I confess that there is something exhilarating, or at least exciting, and half-manly in the open street manners of San Francisco wickedness. There is an effrontery about it that astonishes you and takes your breath, and I should not be surprised, withal, if the reformation, which we hope for in all of our American municipalities, will find easier

work with the half-honest wickedness of San Francisco than with the down-cellar, smutty and cowardly degradation of some other great cities.

Such is my diagnosis of the case. As to the average mental force of society on the Pacific slope, and particularly in the chief metropolis, I should rank it very high. I am inclined to believe that the San Franciscans are among the most intellectual peoples of the world. They seize industrial and social problems with a vigor and ability quite unparalleled, and their courage is equal to their intellectual vehemence. It is not the policy of this people to trifle long with any Gordian knot. They simply cut it, and then boldly claim that a cut is better than an untie, anyhow. I am willing to ratify this opinion myself. To show skill in disentanglement and to save whip-cord is a good thing in its way, but takes time, and time is money and development and fortune. Inasmuch, therefore, as life is short, out with your sword and cut. The knees of all complication knock together whenever you get out your knife.

It is needless that I should review the tremendous enterprises which are a part of the history of San Francisco. Her public life has been one of extraordinary power and persistency. She has her group of millionaires, scarcely less conspicuous, and not at all less fertile in resources, than are the financial nabobs of New York. These men, nearly all, came into the State as mere adventurers. They were big-boned, big-brained, reckless boys, who looked upon this western world as a battle-field. Their minds, in the struggle that ensued, had all the splendor of freedom and the gratification of victory. They wrought as they would with the turbulent elements which roared in the chaos along the shores of the sea. Perhaps they have been unscrupulous; doubtless their hoppers have swallowed up hundreds of smaller fortunes and thousands of human lives; but they have had the virtue of vigor and the worth of an untrammeled manhood that is entitled to no small meed of praise.

Some of these men, like Stanford, have turned philanthropists in their old days, and are endeavoring with all their might to regenerate the society of California by means of their money. I hope that they will succeed. My sympathies are greatly enlisted with the Stanford University; and I have already had occasion to try my hand at prophecy respecting the Lick observatory. Old James Lick was himself a character. He was what the people of the Wabash valley would call a hard case. In process of time the biographers, after their usual manner, will try to lie him white; but they will have a hard task on their hands. One time he directed his workmen to set out a prune orchard for him, putting the tops of the trees in the ground and the roots in the air; and when about two-thirds of them broke his orders by planting the trees as they ought to be, he drove every one of them out of the orchard. It was he who, in his old age, built a mill at San José in which the hoppers were made out of rosewood and mahogany—this for the reason that in his youth he had loved a miller's girl, or thought he did, in Pennsylvania, and the miller had incontinently kicked him out.

Young Lick, thus licked, had gone forth swearing that before he died he would build a mill in which a single hopper should be worth more than the whole establishment of his cussed old hypothetical father-in-law. So, after fifty years, when the old miller was long dead, he made this mahogany-rosewood hopper at San José, thus doing the thing he had sworn to do when he was kicked out of the Pennsylvania grist-mill. Such was the real Lick. The biographers will, by and by, veneer and mythologize his character, but they can never make him other than he was. Nevertheless, this quaint old genius of the Santa Clara valley could appreciate the glory of the heavens, and could contribute to mankind an apparatus for the starry apocalypse of the hereafter. I trust that all millionaires will do likewise, and that the caprice and inconsistency of human life will in its last act always emulate the philanthropy and generous impulses of old Jimmy Lick.

The Melican man in San Francisco always goes to see his brother John. Chinatown is a marvel. It is an oriental city set on the breast of a larger American city—a spot of the profoundest conservatism on the surface of the most vehement radicalism of the human race. The Celestials in this *urbs in urbe* number fully 50,000. They come, and go, and trade, and get gain, and sing out their attenuated metallic speech, until the stranger in their midst may well imagine, if, indeed, he is not forced to believe, himself to be in China. Nor is the place far away from the heart of the metropolis. Chinatown is no ragged edge, no mere depraved outskirt, of San Francisco, but right here in the midst of the occidental Babylon.

A walk of only three or four squares from Market street, and here you are in Asia. I believe that the two populations around the rim of the Chinese quarter do not mix and mingle except for purposes of trade. Chinatown is your splotch of oil on the watery surface of Americanism; it floats, but mixes not. I am not sure but what the figure might be expanded until it embraces the idea of a scum.

John is an unsolved problem. He is a sort of "x" in the incomplete cubic equation of universal progress. Solve him who can. The Californians are at loggerheads about his place and value. I found that all inland industries are largely dependent upon him for their practical promotion. The grape-growers about Fresno declare him to be a *sine qua non* of their success. The superintendent of the Land and Water Company at San Fernando told me that, of all his men, only the Chinese laborer could be relied on for steady and profitable work. The fruit men and farmers hold the same opinion. They laugh at the stupidly imitative character of their Chinese tree-trimmers and plowmen; but, at the same time, they pronounce him invaluable to their enterprises. In the cities, however, these sentiments are utterly reversed. Here the tune is sung in a high and piping key of bitter antagonism. The fact is that the city folk hate the Chinese with a cordial and unequivocal hatred which I could not quite understand. They despise them. They think of them in the same category with rats and other vermin.

I perceived that a part of this malignity was traceable to politics. The

politicians are down on John, with a violent, stamping sort of animosity, which makes you think of the rabies. Albeit, the bottom of the business is the fact that the other laboring classes in California, made up mostly of Irish and Scandinavians and the miscellaneous *pot-pourri* of all nations, conceive themselves to be ruined by Chinese cheap labor. It is simply the moral of Bret Harte's poem exemplified and illustrated in practical life. Paddy and Fritz and Bjorne all vote. John does not vote. Paddy and Fritz and Bjorne are, therefore, *ferninst* poor John, and are anxious for his destruction. They call him a dirty haythen—and I believe it is a true bill.

My scurryings around Chinatown convinced me that human dirtiness is not one of the lost arts. Nevertheless, the better class of Chinese are clean enough, and dress with a certain elegance. You may even see nabobs among them. I could perceive, here and there, unmistakable evidences of a kind of filthy luxury, which one might possibly admire with his eyes, but would not care to touch with his fingers. I went, under direction of an intelligent guide, and accompanied by my friend Mason, through several bazaars and shops, and especially on a visit to the great upstairs restaurant, so called, and the central joss-house. Our cicerone explained everything to us, in tolerable English, as we went along. Nor was he devoid of wit in his pungent comments on the things Asiatic which he had the pleasure of showing us.

The restaurant might well deserve a chapter and the joss-house another, if we were to do justice to the peculiar interest which they excited. In the former place I saw the most elegant woodwork which it was ever my pleasure to examine. The establishment is rented out, night by night, to groups of oriental revelers, who pay $600 a session for the use of the hall and the appurtenances thereto. This, of course, includes the table d'hote and all incidentals; and I learned that some of the incidentals were of such horrible wickedness that it would agitate your hair if I should tell you about it. In the joss-house I saw Mumbo Jumbo himself and all of his family. I learned from the guide that the Chinese theory of Mumbo is that he is not present in the wooden idol which sits up there solemnly before you. He is out in the air. When you want him to come in and inhabit his effigy, you ring the big bell which hangs by the vestibule.

Mumbo hears it, and in he comes, invisible to mortal eye, and ensconces himself in his wooden semblance up there on the platform. Thereupon the worshiper makes known his wishes in prayer. He gets down and hits his forehead on a cushion on the floor, and then, after having expressed his wants, he casts lots, whereupon he is able to discover, by cabalistic writings on little slips of bamboo or red paper, what the answer of Mumbo to his prayer may be. One Mumbo is for Day, another for Night; one is for the Wind, and another for Thunder. It is all very beautiful, but I was much more interested in watching the expression of my guide's face and the tones of his voice, to ascertain how much stock *he* took in the business. It was not much. I could see clearly enough that he was far gone into the purlieus of skep-

ticism. I neglected to say that the whole theory of Mumboism, as practiced by these Chinese, is merely the notion of advantage. The estimate of their gods is based on the idea of their usefulness. The most devout worshipers in the joss-house are the gamblers, who, almost every morning, may be found there, taking counsel of Mumbo as to whether they shall or shall not speculate on that day.

Turning to the industrial aspect of Chinatown, I was gratified to note the excellence and artistic finish of nearly all their work. Their skill is something to be astonished at. Never otherwhere will you see such wood engraving as in these little shops and stalls. I watched one old artisan, fairly rickety with age, grasping a blade like a shoemaker's knife in his right hand and cutting away at some Chinese types. The pieces were about the size of ordinary dice, and the skill and accuracy of his cutting surprised me beyond measure. I suppose he was making five or ten cents a day. I ran the imminent risk of small-pox by taking in the Chinese quarter of the city. But all's well that ends well: I saw the sights, and the small-pox has not yet claimed its victim.

The happy climate of San Francisco puts her people much out of doors. Even in midwinter they throng the streets and sally forth into the park. I insist that the boulevards and arena of Golden Gate Park are, of a sunny afternoon, as brilliant a scene as may be witnessed anywhere outside of the Bois de Boulogne at Paris. In the evening the city is brilliantly lighted. Electric burners fling their clear radiance through the air, and the streets, with their gay throngs pouring out of the opera-houses, flash in the sunshine. San Francisco goes late to bed; and I should not be surprised if she sometimes wakes up with the headache.

I repeat the expression of regret that my visit to the Pacific coast and to this metropolis of California is here and now cut short. I can not stay any longer. I must catch a few hasty greetings and farewells with my friends at the Palace, and be ready for the morning train. For many weeks this, to me, new panorama of nature and of life has been passing before me; but the backward tug of duty and affection, stretching so far beyond the mountains, must now prevail over the natural wish to stay longer and see more along this margin of the Pacific.

One must needs take home with him from the transmontane regions something in the way of souvenirs. Nothing pleases me so much as the brilliant shells, and pearl goods manufactured therefrom, which may be plentifully gathered at almost any point on the coast, but particularly at the great manufactory of R. W. Jackson, of 614 Market street. Here you may find the most beautiful specimens of laminated pearl and delicate fabrics made therefrom. Across the way the Japanese bazaar will also contribute to your store. But if any man thinks that I am advertising these shops, let him be disabused. It is very wrong, my fellow-mortal, for you to suppose that I would do such a thing! I merely say that I gathered my trunks full of these beautiful wares, and on the early morning of the 19th of February made my

way alone to the Oakland boat and the Central Pacific train. The sun is up, and the bay is as bright as that sea of glass which St. John saw at Patmos. The water-fowl are skimming its surface. The air is balmy, and the heaven is blue as I take my last look at the beautiful water and the surrounding shores. O Yerba Buena, fare thou well, and be thou happy, and be good, also, if you can!

My programme for the home run is by way of the Central Pacific and the Denver & Rio Grande. I still promise myself much admirable scenery and many points of interest on the journey. By noonday we are again at Sacramento. I say we editorially and out of courtesy to my fellow unknown travelers. As for our own pilgrims, they are all scattered into isolation and silence. Not one is aboard this train, except the writer, and he by no means enjoys his own company, being rather melancholy at the backward turn. At Sacramento we dine; and here I meet, by accident, at the table, my friend Hon. M. M. Estee, and also the popular Governor Waterman, whom we did not have the pleasure to meet on our former visit to the city.

After leaving Sacramento, the Central Pacific heads for the mountains, and strikes them at the little town of Colfax. You enter the Sierras proper at Clipper Gap, and begin an ascent through a series of scenes of great beauty and grandeur. At this place I first saw, in its full native sublimity, the mountain forest of California. It is of pine and spruce, and one must needs be greatly impressed with these splendid trees, crowded together in vast areas and prevailing even to the summit of the Sierras. The passage of the Central Pacific over these heights carries the traveler through some of the wildest landscapes to be seen in California. I greatly enjoyed the passage, and, being in a day car, almost by myself, I found opportunity to study the scenery, and presently to observe the mining camps and mountain towns with more care than I had been able to bestow on many other localities. You may see in these parts the sluices which the miners have constructed, their reservoirs of water, and their mining apparatus, on either hand, as you fly along between and around the Nevada heights. I have not anywhere seen American life in so wild and free an aspect as here in the mountain camps and Swiss-like hamlets of the Sierras. In our brief stops at the stations I noted with pleasure the tone and rhythm of human character in these almost inaccessible places. I like the mountaineers. There is a stalwart honesty and patriotism about them which will long preserve a nest for human freedom in the hill-tops and fastnesses. It was to me a matter of regret that the after part of this section of the homeward journey was covered by darkness. I had no opportunity to take a view of Ogden, being obliged to satisfy myself, or rather dissatisfy myself, with a mere glimpse of the city as she sat obscurely in the gloom of night.

From Ogden to Salt Lake City the run is brief. You are already transferred to the splendid narrow-gauge road called the Denver & Rio Grande. About midnight you are lodged at Salt Lake, and, with the early morning, gain your first view of what is perhaps the most marvelous landscape in the

United States. You find yourself circled entirely around with the mountains. The air is exceedingly clear, and the mountain wall seems to rise almost perpendicularly from the valley. The lake is not visible from the city, and the aspect is very desert-like and oriental. A few trees have been planted here and there along the highways issuing from the city; but otherwise there is no symptom of vegetable life. Still, you perceive from the markets that the region is productive in the highest degree, and doubtless a traveler in summer would find everything green and flourishing. I take it that the facilities for irrigation are as great as the exigency, and already the Salt Lakers have availed themselves of the water supply of the mountains.

Hundreds of correspondents and book-writers have already described the running water in all the gutters of Salt Lake. Here it goes, in quite a sluice, between the broad sidewalks and the still broader streets. I discovered in and around the city a large display of municipal common sense. The thoroughfares are hardly less than a hundred feet in width, and everything is as clean as a pin. The place impressed me as being especially orderly and well-directed in all civic matters. I do not know who is responsible for the good management displayed in this Mormon metropolis; but the management is here, and I suppose it must be set down to the credit of the saints.

Over most of the principal establishments in Salt Lake City you find the cabalistic Z. C. M. I. The writer was green enough not to know at first what they stand for, but soon discovered that the meaning is Zion's Co-operative Mercantile Institution. I was not aware, until visiting the place, that co-operative industries were a part of the Mormon system; but that is their idea of doing the business. I found, however, by a little close inquiry, that the co-operation is generally run in the interest of the co-operators; and that means that little syndicates, organized after the manner of white men, have got control of what were intended to be really popular institutions of trade, and are running them for their own benefit. So the saints are even as the rest of us. But I found that prices were materially lower under the influence of the system than in other places where the cupidity of the sellers has no check at all. I went through the largest mercantile establishment in the city, sizing it up in a casual way, as to its methods and peculiarities. All the employés are Mormons; but I could not discover any particular symptom of sanctimony. The young saints behind the desks and the pretty saintesses at the counters were not perceptibly different from the young people who sell and chat and court a little in the other big stores of the country.

It came to pass, in ancient times, in the reigns of King Tyler and King Polk, that a certain Smith, whose surname was Joseph, arose and did strangely in the land. He found a certain book of the prophets which he took for the man of his counsel, and thought himself a holy man after his kind. On a certain day, as he walked among the tents of the patriarchs, he saw a certain woman whose name was Poly Gamy. Her he took unto him-

self and made her his wife. This seemed strange to the people, for a younger sister of Poly, whose name was Mono Gamy, was more fair to look upon than her sister, and was much more favored by the young men of the people. But Joseph clave to Poly, and took her with him to the far western lands whither he journeyed; and about him he gathered other folks who thought as he did and did as he thought, until a tribe arose. He also named their wives Poly—and here endeth the first parable.

During my stay in Salt Lake I sought diligently to get at the bottom of the situation. As a summary of the whole business, I express the opinion that the polygamous aspect of Mormonism is on the wane. It is said with confidence by those who are friends to the saints that not more than two, or, at most, three, per cent. of them are now dabbling in multiple marriages. Still, the doctrine of polygamy is stoutly, even vindictively, maintained by all the leaders of Mormondom. At least, that is my judgment of the situation. I made the acquaintance of several of the foremost men among them, and found them as debonair gentlemen as any one might wish to meet. By the courtesy of my friend Dr. Iliff, I was introduced to the president and faculty of Deseret University, and had the pleasure of an extended informal talk with them relative to the institution. They were at work with their classes as in other colleges, and the young people appeared in no wise different from the common type of American students. I also visited the editorial sanctum of the leading Mormon newspaper, and was cordially received by the editor, Mr. Nicholls, who had recently suffered severe penalties under the Edmunds bill. Of course, I could not well converse with these gentlemen on the tender point of multiple marriage, but I found a few persons with whom I might talk on the subject without violating the proprieties.

I was much impressed with the form and substance of the Mormon Temple. It has the finest stone walls of any structure I ever saw. For the present it consists of walls, and nothing more. All within and above is open to the sky and elements. I was struck with commiseration as I thought upon the vast amount of money which had been here expended, and the hard toil of thousands wasted, as it seemed to me, upon a hopeless symbol of an effete form of thought. In the adjacent Tabernacle I found a great and practical interest. There is no other such structure in America, or in the world. Viewed with respect to its adaptation as a place for public gathering and speech, it has no equal. All that has been said relative to the marvelous acoustic properties of this hall is strictly true. There can be no exaggeration as to the facility with which you speak and hear in this vast parabolic assembly room. The seating capacity is for ten thousand people. Anything above an ordinary conversational tone on the part of a speaker occupying the rostrum, which I take to be placed in or near one of the foci of the ellipse, would be wholly superfluous. A whisper, or the falling of a pin, can be distinctly heard at any station on the floor or in the gallery. The tabernacle is the work of Brigham Young, and I emphatically declare it to be the only common sense public hall that is in the world. It is cheap, economical

of space, perfectly accessible in all parts, easy of exit, secure against accident, solid as a rock, and susceptible of decoration. It must be a positive luxury to a speaker to occupy the platform of this marvelous hall.

Over yonder, against the mountain-side, to the south, is Fort Douglas, but I find no time for a visit. About eighty per cent. of the voters in Salt Lake are Mormons. I dare say that in all local affairs they have their own way, even to particulars. I incline to the opinion that the religious system professed by these people is no longer espoused and gloried in as it was aforetime, but is accepted as the proper thing, pretty much as formal municipal christians sometimes accept their church. Meanwhile, a spirit of enterprise has appeared in Salt Lake, which is leading to the rapid development of the valley. Here is an open secret: the biggest of the booms is going to be, erelong, in this city of the latter day saints. If the reader has any money to invest in speculation here is the place. Doubtless he does not like the Mormons, but it may be that he is willing to turn an honest penny by dealing in their real estate.

The time has now arrived for our departure from the valley. I say "our," for by this time I have had the good fortune to make some new friends, as agreeable and generous as those whom I left behind in California. The elegant little narrow-gauge sleeping-coach which takes us up for the passage of the Rocky Mountains has among its passengers several persons whom I shall always be glad to have known. Here I unexpectedly became acquainted with Dr. Pitt Cobbett, one of the law lecturers at the University of Oxford. The Doctor has been out on an extended trip to Australia, and is now making his way back across our continent. I find him a thorough-going English radical, something I should not have expected in an Oxford man and a lecturer on law. Many are the good things which we tell each other relative to the political and social systems of our respective countries. I was able to post him up with respect to the workings of American colleges and universities; and he told me much more than I ever knew before about the inside of Oxford and the molecular oscillations of the English mind in its higher realms of activity. If these words should ever meet him at No. 4 Kings Bench Walk, Temple, E. C., I hope they will revive for him as many pleasant memories as the recollection of himself and his conversation does now for me.

I should be wicked not to add the names of Mr. and Mrs. F. G. Heffling and little Claudia, their daughter, of Chicago, and, also, Mr. and Mrs. Frank A. Anderson, of Kansas City. Than these I met no people more agreeable and happy-minded. We journeyed together in a little clump of extemporized friendship all the way from Sacramento to Colorado Springs and Denver, and my own enjoyment of the sublime mountain scenery, into which we were now about to plunge, was greatly enhanced by their presence and company. As we entered the shadows of Gunnison Pass and began to whirl between the tall cliffs which overhung our way, the song of little Claudia

brought vividly to mind the recollection of my own girl face beyond the Father of Waters:

> "I'm going to write to papa,
> And, oh, how glad he'll be
> To get a little letter
> That is written all by me!"

I do not know how many notches there are in the mountain wall around Salt Lake valley; but the Denver & Rio Grande makes its way out to the eastward through the gorge of the Gunnison. The ascent of this cañon is rapid; and the river, half bound in most parts with its rugged fetters of ice, plunges down headlong to meet you. It is a full, roaring stream of dark-colored water, reminding you of the pine-stained streams of Wisconsin and the north. The gorge is crooked to the last degree. Nature had her throes and pangs and travail when this great chasm was torn asunder for the passage of the river. Up and on you go; and the precipices on either hand rise to higher and grander elevations. Their face is of blasted granite, weird and dreadful. It was not often, amid the sublime scenes of the coast, that my imagination had been really oppressed by the wildness and magnificence of the landscapes; but in the pass of the Gunnison I began to feel a certain awe, under the shadow of solemn nature. Here she sat in her glory and silence among the terrors of the mountains. Her features were beetling cliffs and dark gorges and overhanging rocks and the glory of distant snow. As you begin to approach the continental divide your attention is drawn to one startling view after another, until wonder is paralyzed and perception loses its sweep.

I had been told that the Denver & Rio Grande would bring us through the wildest and grandest scenery of the continent; but words are impotent symbols when it comes to conveying an impression of the sublimity of these Rocky Mountain fastnesses. I will try, however, to particularize by mentioning a few of the principal features of the inspiring journey from the valley of Salt Lake to Denver. Here we are at Castle Gate. The day is rapidly sinking into night. The gorge is full of shadows. Yonder, before us, is the Gate itself. It is a vast wall, for all the world like the projection of the Colosseum at Rome. Above its ragged edge some stars are shining, and the rising moon yonder casts its faint light through the rifts of ruin. I could not shake off the illusion that it was the Colosseum itself; and presently, when we had returned to our little Pullman and extemporized a party for declamations and songs—when Dr. Cobbett had told us a story, after the manner of Dickens, and little Claudia had sung a song, and Mr. Anderson had given one of his excellent pieces—the specter of the Colosseum was still before me; and, in my turn, I recited for the company the splendid verses from Byron's Manfred descriptive of the ruins of the Flavian Amphitheater.

Morning found us still rushing along among the higher peaks of the Rocky Mountains. We were coming to Marshall's Pass, which is the true continental divide. Ah, such engineering as it has taken to bring this little

railroad, twisting around the mountain summits, and rushing up and upward, through the very clouds and snow! It is cold at this great height. Here we are, at last, amid the bleak sublimity of the pass itself. We are 10,856 feet above the level of the sea. Conversation has ceased; the hands of many of the passengers are swollen; and the faces of some are livid from the outbursting blood. As for myself, I experienced no sensation except a slight tendency to drowsiness. But I notice that the action of the lungs is accelerated and abnormally vigorous. Now it is that if you have a good breathing apparatus it stands you well in hand. You are among the incipient glaciers of the Rockies. Your train winds round and round; the heavens spin, and the earth totters, but regains her balance, and stands fast. Fain would the conductor, who is used to view on every trip these tremendous aspects of nature, call your attention to this and that. You answer him not. You have enough. I confess that my recollection of these magnificent heights is a kind of glamour which does not resolve itself into clear outlines of form and substance.

Over the crest you go. Your second engine is cut loose, and flies ahead, plunging downward at the rate of 211 feet per mile. Presently you see the little giant in a valley away below you, and coming back, apparently, to the train. Here is the track and yonder is the track; above you is the track and below you is the track; and even your own train seems to go in all directions at once. But down you go, and your excited respiration begins to subside, and the world comes back, and with it the current of your natural thoughts.

If I had any reserved fragment of language or list of images for what may be considered a special emergency and demand, I should now, once for all, draw upon the same, in the hope of conveying to the reader my impressions of the Black Cañon and Royal Gorge. But I have no unexhausted resource, and the vision will have to pass without a transcript. Still, the vision is before me. It rises above all others of its kind, and is conspicuous in the halo and vista of memory as something not to be duplicated or compared. At the bottom of the great chasm, narrow, dark, and ominous, lies the little double band of iron, riveted to the rocks by the puny hands of man. The rushing stream, new-born out of the mountain snows, plunges and foams by the side of the track; and the abyss winds before you and behind you, through a labyrinth of shadows.

It is gloomy here. Specters and spirits, and even dragons of the nether world, might arise out of the cavernous recesses and somber notches in the granite cliffs beside you. The roar of the little train is swallowed up in the oblivion of the gorge. On either hand the almighty cliffs rise perpendicularly from the edges of the river and the track, to the height of 3,000 feet. Thirty tall trees, standing one above the other, would not reach from the bottom to the open air and heaven on high. The granite battlements overhang the way. They form a bridge above you. They shut out the light. The sky above is only a narrow ribbon of blue. Down here are silence and darkness—and might be death.

For four miles you plunge along, and wind through this infinite ravine, overawed by the shadows and terrors that hang around you; afraid to speak, lest God might hear your voice and answer. These visions, O my friend, are not fictitious, but real! I will say no more of what I see by this backward look into the gloom and glory of the Royal Gorge. All the rest I leave to your own thought and to the hope that some time you, also, may feel the overpowering grandeur of the scene, and issue to the world again, as I did, with a sort of changed purpose and spirit for the rest of the journey of life.

This side of the continental divide the traveler strikes the source of the Arkansas. He journeys down that river from the crest behind him to the open world beyond at the old town of Pueblo. Many things are of interest here; but one on his homeward journey hurries along. Sometimes observant and sometimes dreaming, he relinquishes the sight-seeing spirit, and begins to take up his old threads of thought and weave them again into some practical web of present and prospective action. At Pueblo a brief stop gave me opportunity to look about the old camping-ground of those adventurers who, first drifting from the Middle States and fetching up against the mountain wall, paused for a moment ere they plunged into the unknown gorges before them. I insist that man is an ambitious little animal, and his enterprise, as manifested in his conflict with the tremendous forces of the material world, shines out conspicuous over the apathy and inaction of other forms of life. If he were not such a rascal, you might admire him much and—love him a little.

Issuing from the Rocky Mountains, the traveler feels that he is again in the United States, or at least in North America. Yonder spreads the Colorado plain, looking as broad as Texas and as innocent as Kansas. We make a formal stop (alas, how few *we* are by this time!) at Colorado Springs, and take a rest over night at the hotel called The Antlers. As matter of fact, the antlers are set up over the fire-place in the lobby. Once they belonged to my lord the mountain elk; but they have been torn from his magnificent head and planted against yon wall to give a name to a Rocky Mountain caravansary, in which the accommodations are first-rate and the charges fabulous.

My friends, the Hefflings and Dr. Cobbett, do not stop—only Mr. and Mrs. Anderson and myself; and them I am to lose at Denver. One more day, however, we pass together. We visit the springs, three in number—White Sulphur, Soda, and Iron—in the order of your ascent of the valley. And splendid springs they are, too—among the very best of their kind in the world. I should think that any alleged invalid, drinking out of their waters, breathing this mountain air, and regaling his vision with the snowy top of Pike's Peak, only a few miles away, would have to show good reason for dying; he would, at least, be on the defensive.

From these springs of Manitou you take a brief and pleasant drive into the Garden of the Gods. This world-famous arena of silence and spectral forms of rock lies between the valley where the springs are and the open

Colorado plain. If you would get an idea of its appearance, you may consult the photographs or visit the place yourself. I am wearied with the attempt by means of this poor vehicle of human speech to convey to you, my reader, in any proper sense, an image of what you see, or may see, among the summits or along the base line of the Rocky Mountains. I bid you go thither also, and witness for yourself what nature, in her grander moods, is able to display.

For myself and ever-narrowing company of friends, we take the train at evening and are away for Denver. They do say that the writer is expected there on the evening of the anniversary of the Father of his Country, to stand up behind a desk, after the manner of a mortal man, resuming the attitudes and methods of the people in the Ohio valley, and to tell them—that is, an audience—what he knows about *A Fight with Force* and *Catharine the Great*. Meanwhile, he does not know whether the old currents of thought and speech will come again, or whether they have disappeared forever among the solitudes of the Sierras and the Rockies.

A few words about my stay in Denver, and I have done. I was immensely pleased with the city, and venture to express a judgment, which I believe to be well warranted by the facts, to the effect that Denver is one of the most prosperous and promising cities in the United States. To begin with, she is solidly built. Her streets are broad and straight. The level plain round about gives opportunity for indefinite expansion. The river, to be sure, is not good for much, and is at times exceedingly ill-behaved. But it bears some water, and that is in the nature of a blessing.

The industrial conditions of the city are exceedingly good. The two principal lines of enterprise lie by way of the railroads and the smelting furnaces. At the head of the former stands the veteran millionaire, ex-Governor John Evans, who has recently succeeded, after a long struggle, in completing his line from Denver, by the way of Fort Worth, to the gulf, at Galveston. The first of the mining furnaces are the Grant works and the Argo. At the latter I was greatly interested in observing as much as any outsider is permitted to know of the new method discovered or invented by Superintendent Pearce, by which the combined ores, gold, silver, copper, lead, and what not besides, are separated from each other, as if by natural differentiation, on their issuance from the smelting process.

By the courtesy of Mr. Pearce, I was admitted into the private rooms of the works, and saw with my own eyes, but by no means understood, the beautiful liberation of the precious metals by the superintendent's method. I should not be surprised if it is one of the most valuable secrets known in the practical arts of the century. It is not only much more expeditious and cheap than the tedious and costly work of assaying by the old methods, but the result is more valuable, in that the metal on its issuance, by Mr. Pearce's method, is exceedingly pure. Just before going into the bullion room, a gold brick had been turned out, which I was permitted to inspect and handle. It was about twelve inches in length, four and a half inches

broad and four inches in thickness. The weight was 128 pounds, and the metal was so pure as to rate at $20.65 per ounce, making the value of the brick about $45,000.

Such things are mere trifles around the Argo; and the Grant works are only second in their output. In either you may see a trough full of pure silver-sponge, as big as a good-sized manger in a barn. I think that the ores which are worked in these great establishments are, as a rule, very refractory; and their treatment requires the greatest pains and the best watchcare of scientific skill.

I was delighted with the character of the Denver people. The newspapers are of a high grade; and every public aspect of civic life indicates, unmistakably, the presence and endeavor of a high-minded and vigorous community. There is in Denver a considerable aggregation of distinguished men, and they exhibit a public spirit worthy of the highest commendation. I am constrained to say that of all the considerable cities which my winter tours of some ten thousand miles have brought me to, I think I should on the whole prefer Denver. I hope you will not repeat this statement to Los Angeles, for she would be indignant, you know, and declare that the writer is a Denver real estate speculator, which I would he were! Nevertheless, he sticks to his assertion. The solid brick houses of Denver city, her fine public buildings, her magnificent schools, at the very head and front of any with which I am acquainted, and many other elements of human happiness and progress, constrain him to believe that the rational man would prefer this Rocky Mountain Queen to almost any other divinity of the times.

For a full week I stayed in Denver, and familiarized myself, as much as I could, with her nature and variety. There is nothing stale in these brilliant precincts. Much there is, doubtless, which might be fitly defined as reckless. But beauty is prevalent over ugliness, and worth has a clear victory over worthlessness. I found the bar of Denver to be a body of men peculiarly able, scholarly, and eloquent. I should be unworthy of the many favors which I received at his hands if I did not especially acknowledge my indebtedness to my host, Judge O. B. Liddell, a well-tried Hoosier of old days, who, from his pleasant home on Grant avenue, looks out each morning on the city of his choice. To Madame, also, and Olivia, I send a poor return of grateful thanks. Nameless, I suppose, must be the accomplished ladies of the public schools whose delightful society I enjoyed for brief periods during my stay; but not nameless my friend Superintendent Gove, of the city schools, and Chancellor More, of Denver University.

Of one thing I satisfied myself, while tarrying in the city, and that is that the supposed benefit, aye, the actual, undeniable benefit, to persons laboring under pulmonary disease, by residence in this fine, dry, highly electrified air, is in no sense medicinal, but a purely mechanical matter. The atmosphere is so light that much more is required to satisfy the demands of the system for a current supply of oxygen than is demanded at a

lower level. The result is that the lungs are automatically expanded. It is simply a matter of compulsory pulmonary exercise, neither more nor less. The air passages and lung structure *must* open here and now, or the possessor of them must perish on the spot.

As a result, all animals begin to get a larger chest capacity. Take a horse, well grown, from St. Louis to Denver, and in six months his girth will have expanded five or six inches. It is this natural and inevitable enlargement of the chest and its consequent freedom of action that bring back your asthmatic and your consumptive from the shoals of suffocation. Added to this mechanical and necessary exercise of the breathing organs, the patient has also the advantage, if he is at all able to bear it, of the high electrical tension of the atmosphere. I believe that Denver is more surcharged with electricity than any other city in the world. You are so full of this "mode of action" that you know not what to do with yourself. If from the barber's chair you glance into the glass, you see that, under the manipulations of the artist's hands, your hair is standing up like quills upon the fretful porcupine. Timid people are constantly jumping and starting under the freaks of the electrical current. On a favorable day you can walk up to the gas jet, and set it off with your finger. Shake hands and you will feel the shock to your elbow. Touch anything, and you snap and sparkle. For the first day or two these sensations make you uneasy. Especially, if you try public speech, do you experience inconvenience. Your chest seems to be puffed up, and the supply of air on the vocal chords is beyond your management and control.

Denver is a good place to complete your collection of oddities. Here you may still obtain a respectable buffalo hide, dressed or in the raw. In another year, I presume, the traffic in the woolly covering of Sir Bison will have ended forever. You can also buy (but will have to pay a round price for it) the great coat of Brer Grizzly Bear, or Brer Coyote, or Brer Red Fox of the mountain. I observe that the shop-keepers are by no means backward in their tariff rates; and you are forced to stop short by the specter of bankruptcy.

Denver is also the place to collect minerals. My special friend at the Whittier school gave me a box full—most beautiful and rare, and correctly labeled. Yon great battlement of mountains to the west is full of all manner of treasures. As a general fact, it appears to me that the supply of precious metals and rare stones and minerals piled and scattered in the gorges and cliffs of the Great West is absolutely inexhaustible.

Before leaving the city I was taken for a drive by my friends, Judge Liddell and Dr. Bancroft, out to the fine stock ranch of the latter, near the foot of the mountains. Here I inspected the best horses and cattle which I had seen since leaving the green pastures of the Wabash valley. The Doctor is proud of his herd and his stables; and I blame him not for his frank admiration of the well-developed and well-kept animals about his ranch.

I mention this visit in part because of the splendid sunset which marked

its conclusion. I have witnessed two really glorious sundowns in my life. Once, of an October evening, on the crest of Walnut Hills, back of Cincinnati, when the natural haze of the autumnal atmosphere had blended in perfect harmony with the dust and smoke of the city below, I watched the orb of day sink to his rest as to a death-bed of infinite glory. Great bars of light flashed out from his setting to the very zenith of heaven, diverging from the focus of splendor over all the western sky. The radiating bands of light were of amethyst and vermilion and purple and gold. Nor could any feeble expressions of human speech convey to another an adequate idea of the beauty and sublimity of the scene.

How totally different, in all of its characteristics, is this magnificent sunset behind the Denver mountains! Here, everything is as clear as crystal. The air is fairly lustrous in its transparency. You have no premonition of the coming eclipse. The last moments before the sundown are as bright with day as high noon itself. You are bowling along on the plain toward the city, five miles away, but distinctly visible in all its outlines. All of a sudden, a great shadow, stretching from left to right, overtakes you, more swift than the flight of eagle's wing or passage of sailing cloud. The shadow-line rushes ahead across the plain, swallowing everything into the duskiness of an instantaneous twilight. I halt the carriage, and watch with intense interest to see the obscuration of Denver.

Swiftly the line of darkness sweeps on, and suddenly the spires and roofs change from glitter and sheen into the half oblivion of coming night. Farther and still farther the great shadow floats over the plain, until it reaches the horizon, and all is dark. In process of time an evening shall come for you and me, O my fellow travelers, when a shadow like that shall oversweep the evening landscape, and the whole world, instead of one peopled plain, shall pass from our vision into the mystery of eclipse and the curtain of friendly darkness. May that sundown of life find us all in peace, and wrap us in the drapery of a happy slumber!

Here, then, with the great wall of the Rocky Mountains behind us, I take leave of Colorado and her principal city. The flying train is ready to receive us and bear us away to the Kansas line, and thence through the longer diameter of that State, to our place of starting. I still say "our," for the associations of the past sixty days bring back the now well-known faces of a hundred friends; and they, too, seem journeying across these limitless plains of Western Kansas to the place of our departure.

It is a twenty-four hours' ride from Denver to Kansas City. Approaching the eastern limits of the State, I meet old acquaintances, former college boys, who step on and off at the stations. They are no longer boys, but in full estate of manhood, and are making themselves felt in developing this great commonwealth, where the battle of freedom was begun, full thirty years ago.

I notice, as the day wears apace, that we come by easy descent into the lower levels of the Missouri river valley. Presently you perceive that a

great city is at hand; and here, at last, you are. Your train stops, and you step off on the platform. Here, on the 12th of last January, more than five hundred of us were gathered, to nearly all of whom the Great West was then a mystery and a dream. And it is still a dream and a mystery. In our brief sojourn and tour beyond the Sierras we have caught no more than passing glimpses of the great natural phenomena which abound in that new world of wonders, or of the vigorous and progressive civilization that is there in process of development.

This, then, is the end of my poor story. It may interest the reader to know, ere I bid him good-by, that what I have here written is simply the revival of pleasing recollections. During the whole of our winter stay beyond the mountains I made not a single note or memorandum. I have depicted the scenes and incidents of our Western anabasis merely as they have arisen on the dappled screen of memory.

I meet on the platform of the Kansas City station no single pilgrim of our former happy company. They are all, all, gone. But with my well-worn traveling hat in hand, I swing it on high and recklessly propose three cheers and a tiger for the success and honor and ineffaceable memories of our journey beyond the snow-crests of the Nevadas and through the flower-scented valleys of California.

My friends, farewell.

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